4th International Conference
UV & Skin Cancer Prevention
TORONTO 2018

Hosted by:
Canadian Dermatology Association,
Klein Buendel, Inc.,
Ryerson University

CONFERENCE PROGRAM
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ORGANIZING COMMITTEE

Canadian Dermatology Association
Ottawa, ON, Canada

Jennifer Beecker, Chair, CDA Sun Awareness Program, Ottawa, ON
Cheryl Rosen, Toronto, ON

Klein Buendel, Inc.
Golden, CO, USA

David Buller, Senior Scientist and Director of Research
Mary Buller, President and CEO
Barbara Walkosz, Senior Scientist

Ryerson University
Toronto, ON, Canada

George Kapelos, Professor, Architectural Science
Thomas Tenkate, Director, Occupational and Public Health
LETTERS OF WELCOME

Dear Colleagues,

Welcome to the 4th International Conference on UV and Skin Cancer Prevention, and welcome to Toronto, a city renowned for its diversity, global culture and contemporary urbanity.

This is the first UV and skin cancer prevention conference to be held in North America and our momentum builds on the successes of past conferences in Copenhagen, Berlin and Melbourne. Skin cancer is the most common cancer in North America. Population-based skin cancer prevention is a priority for government as well as universities and non-governmental and private organizations. The conference allows us to exchange knowledge and share ideas in this important area of chronic disease prevention.

The Canadian Dermatology Association, Klein Buendel, Inc., and Ryerson University who have contributed to skin cancer prevention initiatives in both community and occupational settings in North America, are delighted to host the 4th International Conference on the campus of Ryerson University. Toronto is an ideal location. It is one of the first communities in Canada to implement a sun safety policy and guideline for employees and city venues. Through the work of the Toronto Cancer Prevention Coalition, Toronto has adopted shade guidelines that are influencing city planning, urban development and public space design for better health.

Toronto’s conference, the fourth in a series, provides a unique forum to exchange the best ideas in skin cancer prevention research and practice among researchers, practitioners, clinicians, public health advocates and environmental designers worldwide. We welcome conference attendees from 17 countries in North America, Europe, Australasia, Asia and Africa whose presentations and posters describe the latest efforts in population-based skin cancer prevention.

The conference’s plenary sessions showcase global experts who are addressing important and emerging issues for preventing skin cancer. These leaders in research and practice have been invited not only to provide their latest insights but also to provoke us, disrupting current ways of thinking about UV and skin cancer prevention. Many of the plenary session speakers are working outside of the field of skin cancer prevention. We anticipate that conference presentations will spark new ideas, propose innovative ways of thinking, and provide opportunities for novel and creative collaborations for skin cancer prevention.

The social program will introduce you to Ryerson University and Toronto through music, history, culture and architecture. Not to be missed is the conference dinner – at historic Hart House – where renowned actor and laureate R. H. Thomson will engage us with a presentation on a global project of remembrance and reconciliation. Conference special events and informal moments are designed to provide you with opportunities to network, connecting with old friends and meeting new colleagues.

May is Skin Cancer Awareness Month in both Canada and the United States of America. The conference is a timely reminder of the importance of continuing research and practice in preventing this chronic disease. We look forward to our time together and hope you will return home inspired to continue in your work to make a difference in skin cancer prevention.

Sincerely,

Julie Powell, MD, FRCPC
President
Canadian Dermatology Association

Mary Klein Buender, MA
President
Klein Buendel, Inc.
USA

Mohamed Lachemi, PhD
President
Ryerson University
Canada
May 2018

To: Conference Delegates – The 4th International Conference in UV and Skin Cancer Prevention

As the Medical Officer of Health for the City of Toronto, I welcome you to our city and to the 4th International Conference in UV and Skin Cancer Prevention. Toronto Public Health is proud to be a Bronze sponsor of the conference which brings together global experts on this important topic.

Skin cancer, the most common malignancy in Canada, is caused by exposure to harmful ultraviolet radiation (UVR). UVR is the major cause of approximately 6,800 cases each year of melanoma, the most serious form of skin cancer. Incidence of melanoma is on the rise. Yet skin cancer is largely preventable.

Toronto Public Health works with community partners to prevent risks related to UVR, including exposure to the sun and indoor tanning. We take an active interest in creating environments and promoting behaviours that support the prevention of skin cancer in Toronto. Partnering with the Toronto Cancer Prevention Coalition, we co-created the Toronto Shade Policy, a first of its kind in North America and an evidence-informed approach to preventing skin cancer.

The 4th International Conference in UV and Skin Cancer Prevention presents a wonderful opportunity for you, as delegates, to develop new partnerships and enhance existing collaborative efforts to prevent skin cancer. With its impressive roster of national and international experts sharing their insights on skin cancer prevention, UV radiation science, dermatology, design and environmental planning, I am certain that this conference will engage and inspire you to continue the important work that you do.

I wish you all a fruitful and stimulating conference.

Yours truly,

Dr. Eileen de Villa

Medical Officer of Health
May 2018

Dear Delegates:

On behalf of the Toronto Cancer Prevention Coalition (TCPC), I welcome you to the 4th International Conference on UV and Skin Cancer Prevention taking place in Toronto, Canada’s largest city.

Established in 1998 by Toronto Public Health, the TCPC is a unique coalition of over 40 organizations drawn from government, academia, labour, health, environmental and citizen groups, school boards and cancer survivors. The TCPC leverages the strength of its partners to provide leadership in the primary prevention of cancer. Through our initiatives, we develop and advocate for healthy public policy to support the broader determinants of health, which may be beyond the scope of any one organization.

Public policy to support shade creation, whether natural or constructed, is a key strategy for preventing skin cancer caused by exposure to environmental ultraviolet radiation (UVR). Through its Ultraviolet Radiation Working Group/Shade Policy Committee, the TCPC has successfully put shade on the City’s cancer prevention agenda. Consequently, Toronto became the first Canadian city to implement a shade policy and guidelines, and is inspiring other jurisdictions to follow. Activity in Toronto for shade creation represents a successful synergy linking UVR awareness and skin cancer prevention with public health, city planning, parks development, urban forestry, civic design and health promotion. The 2014 Call to Action to Prevent Skin Cancer from the US Surgeon General cited Toronto’s Shade Policy as an important success story in skin cancer prevention. Members of the UVR Working Group have disseminated research outcomes widely, making our work known in publications, conferences and on-line seminars.

We hope that Toronto’s conference will continue the exciting discussions initiated at past conferences in Copenhagen, Berlin and Melbourne. Members of the TCPC and I look forward to engaging with you in your discussions and deliberations during coming days of Toronto’s conference.

Sincerely,

Anne Wordsworth, TCPC Chair
annemwordsworth@gmail.com
GENERAL CONFERENCE INFORMATION

- **Registration Desk Hours:**
  - Tuesday, May 1, 2018 - 16:00-19:00
  - Wednesday, May 2, 2018 - 08:00-17:00
  - Thursday, May 3, 2018 - 08:00-17:00
  - Friday, May 4, 2018 - 08:00-10:00

- **Complimentary Wifi:**
  - Username: RUguest2018
  - Password: Acce$$2018

- **Mobile App - login details:**
  1. Download and install the Attendify mobile app on your iOS/Android device.
  2. Create a profile by entering your email and making a password.
  3. Go back to the main menu and search for the event name “UV & Skin Cancer Prevention” and enter the code: UVSCP2018 and join the event.

- **sunZapp -- login details:**
  1. Download and install sunZapp on your mobile device (Apple or Android).
  2. Enter code 4THUVIC18 when prompted on the home screen for a complimentary upgrade to the Pro version.

- **Cell Phones** - be courteous of others and please remember to silence or put your phones on vibrate prior to attending any sessions.

- **Sessions** - there will be no tickets required for any of the workshops or sessions. Please wear your conference name badge for entry.

CONFERENCE SPONSORS

We gratefully acknowledge the contributions of our sponsors. Thank you!

Silver:

Bronze:

Co-Hosts:

Funding for this conference was made possible (in part) by 1R13CA224864-01A1 from the National Cancer Institute and the Office of Behavioral and Social Sciences Research.

The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention by trade names, commercial practices, or organizations imply endorsement by the U.S. Government.
## PROGRAM AT A GLANCE

<table>
<thead>
<tr>
<th>Tuesday, May 1</th>
<th>Wednesday, May 2</th>
<th>Thursday, May 3</th>
<th>Friday, May 4</th>
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<tbody>
<tr>
<td>Registration Desk 8:00-17:00</td>
<td>Registration Desk 8:00-17:00</td>
<td>Registration Desk 8:00-10:00</td>
<td>Plenary 5 - Issues in Dissemination of Skin Cancer Prevention Interventions (ENG 103) 8:30 - 10:00</td>
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<td>Welcome Introductions (ENG 103) 8:30 - 9:00</td>
<td>Plenary 3 - New Research Methods for Skin Cancer Prevention (ENG 103) 8:30 - 10:00</td>
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<td>Concurrent Sessions 4A - On the Job: Sun Protection for Outdoor Workers (ENG102) 4B - People &amp; Places: Examining UV Exposure &amp; Protection (ENG105) 4C - Prevention Campaigns: New Approaches &amp; Sustained Impacts (ENG106) 13:30 - 15:00</td>
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<td>Conference Keynote (ENG 103) 9:00 - 10:00</td>
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<td>Morning Break 10:00 - 10:30</td>
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<td>Concurrent Sessions 1A - Trends in Indoor Tanning &amp; Tanner Behaviour (ENG102) 1B - Perspectives on Shade &amp; Environmental Design (ENG105) 1C - UV &amp; Health Communication Strategies (ENG106) 13:30 - 15:00</td>
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<tr>
<td>Plenary 1 - Second Generation Audiences for Skin Cancer Prevention (ENG 103) 10:30 - 12:00</td>
<td>Concurrent Sessions 2A - Starting Early: Sun Safety for Children &amp; Schools (ENG102) 2B - Advancing Methods &amp; Tools in Skin Cancer Prevention Research (ENG105) 2C - UVFX: Skin Cancer &amp; Other Outcomes (ENG106) 13:30 - 15:00</td>
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<td>Concurrent Session 3A - Indoor Tanning Legislation &amp; Regulations (ENG102) 3B - Primary &amp; Secondary Prevention Initiatives (ENG105) 3C - Updates &amp; New Considerations on Sunscreen Use (ENG106) 13:30 - 15:00</td>
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<tr>
<td>Lunch &amp; Poster Session 1 (ENG Lower Foyer) 12:00 - 13:30</td>
<td>Concurrent Sessions 3A - Indoor Tanning Legislation &amp; Regulations (ENG102) 3B - Primary &amp; Secondary Prevention Initiatives (ENG105) 3C - Updates &amp; New Considerations on Sunscreen Use (ENG106) 13:30 - 15:00</td>
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<td>Afternoon Break 15:00 - 15:30</td>
<td>Concurrent Sessions 3A - Indoor Tanning Legislation &amp; Regulations (ENG102) 3B - Primary &amp; Secondary Prevention Initiatives (ENG105) 3C - Updates &amp; New Considerations on Sunscreen Use (ENG106) 13:30 - 15:00</td>
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<td>Closing Session/Our Community of Practice Public Session (ENG 103) 12:00 - 13:30</td>
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<td>Plenary 2 - Environmental Issues in Skin Cancer Prevention (ENG 103) 15:30 - 17:00</td>
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<tr>
<td>Registration 16:00-17:00</td>
<td>Poster Session 2 Wine &amp; Cheese (ENG Lower Foyer) 17:00 - 18:30</td>
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<td>Conference Dinner (Hart House, Music Room) 18:00 - 22:00</td>
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<tr>
<td>Welcome Reception (Atrium) 17:00-19:00 pm</td>
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- **Preconference Workshops** Details on page 20
- **Shade Bootcamp** (Architecture Bldg., 325 Church St.) 8:00-17:00
- **Sun Safety and Skin Health in Youth & Young Adulthood Physical Activity** (ENG LG21) 8:30-12:00
- **Screening for Skin cancer: Does it work? If yes, how? If no, why not?** (ENG LG13) 9:00-15:00
- **Online, Mobile, & Social Media Interventions for Skin Cancer Prevention: Lessons Learned in Development, Delivery, and Testing** (ENG LG12) 10:00-12:00
- **Indoor Tan-Free “Skin Smart Campus” Initiative** (ENG LG12) 13:00-16:30
DAILY SCHEDULE

Tuesday, May 1

Pre-Conference Workshops .......................8:00-16:30
Details on Page 20

Registration
(Atrium Foyer, 3rd Level) .................16:00-19:00

Welcome Reception
(Atrium, 3rd Level) ......................17:00-19:00

Wednesday, May 2

Registration Desk
(ENG 1st Level Foyer) ....................8:00-17:00

Welcome & Introductions
(ENG 103) ............................8:30-9:00

Conference Keynote
(ENG103) ...........................................9:00-10:00
Abstracts on Page 22

Priority of Skin Cancer Prevention in Canada
- Jennifer Beecker, MD, University of Ottawa (CAN)

Skin Cancer Prevention in the United States – A Public Health Priority
- Boris Lushniak, MD, University of Maryland (USA)

Morning Break ..................................10:00-10:30

Plenary 1 .................................10:30-12:00
Second Generation Audiences for Skin Cancer Prevention (ENG103)
Abstracts on Page 23

Overlooked Populations and Populations with Health Disparities for Next Generation Skin Cancer Prevention Efforts
- Caradee Wright, PhD, South African Medical Research Council (ZAF)

Respondent: Loraine Marrett, PhD, Cancer Care Ontario (CAN)

Fashion & Culture in Skin Cancer Prevention
- Jennifer McWhirter, PhD, University of Guelph (CAN)

Respondent: Dawn Holman, MPH, Centers for Disease Control & Prevention (USA)

Lunch
(ENG Lower Foyer) ..................12:00-13:30

Poster Session 1
(ENG Lower Foyer) ..................12:30-13:30
Abstracts on Page 77

Concurrent Session 1 .....................13:30-15:00

1A - Trends in Indoor Tanning and Tanner Behavior (ENG102)
Abstracts on Page 27

Introduction .........................Brian Køster (DNK)
13:35 – 13:47
Artificial Tanning Devices: Public Health Interventions to Manage Sunbeds
............................Emilie Van Deventer (CHE)
13:47 – 13:59
Skin Cancer Projections 2007-40 from reduced Sunbed Use and Sunburn 2007-15 in the Danish Population
............................Brian Køster (DNK)
13:59 – 14:11
Indoor Tanners Who Tan in Fitness Centers
............................Sherry Pagoto (USA)
Wednesday, May 2 (continued)

14:11 – 14:23
Tanning Equipment Use: 2014 Canadian Community Health Survey ........................................... Sami S. Qutob (CAN)

14:23 – 14:35
Health Behavioral Correlates of Indoor Tanning in a National Sample of Parent-Adolescent Dyads from NCI’s FLASHE Study ........................................... Kasey Morris (USA)

14:35 – 14:47
When the Path to a Natural Look is Artificial - Findings From a Qualitative Study of Young Female Frequent Sunbed Users ........................................... Nynne Sahl Frederiksen (DNK)

14:47 – 14:59
The Prevalence and Correlates of Heavy Indoor Tanning, Tanning Addiction, and Perceptions of Tanning Cessation ........................................... Jerod L. Stapleton (USA)

1B - Perspectives on Shade & Environmental Design (ENG105) Abstracts on Page 31

Introduction ................................ Nicole Braun (CAN)

13:35 – 13:47
ShadePlus: a study of health-related effects of park refurbishments including shade ........................................... Suzanne Dobinson (AUS)

13:47 – 13:59
Conducting a Shade Audit in Saskatoon, Saskatchewan ........................................... Nicole Braun (CAN)

13:59 – 14:11
Sun-shading in Public Spaces: a survey of twelve European projects ........................................... Christina Mackay (NEL)

14:11 – 14:23
Shade vs Shadow: the conflict between access to daylight and UVR protection, wither urban policy? ........................................... George T. Kapelos (CAN)

14:23 – 14:35
UV radiation and urban shade trees: How much protection can they provide us? ........................................... Janani Sivarajah (CAN)

14:35 – 14:47
Alliance for UV Protection: Prevention of health damage caused by the sun - Structural prevention in urban and rural areas ................................... Cornelia Baldermann (DEU)

14:47 – 14:59
Partners in Action: Integrating Shade Design in Public Places for Cancer Prevention ........................................... George T. Kapelos (CAN)

1C - UV and Health Communication Strategies (ENG106) Abstracts on Page 35

Introduction ................................ Danielle Paterson (CAN)

13:35 – 13:47
Economic Benefits of Australia’s SunSmart Program ........................................... Craig Sinclair (AUS)

13:47 – 13:59
Information to Consumers, Are We in the Know? ........................................... Brigitta Boonen (BEL)

13:59 – 14:11
A Hole in One – Promoting Sun Protection in Golf Settings ........................................... Elizabeth King (AUS)

14:11 – 14:23
Help a Dane - How the World Helped Raise Danish Awareness about Sun Protection ........................................... Thomas Koefoed (DNK)

14:23 – 14:35
Does It All Add Up? Impact of a State-Wide Television Campaign about Incidental and Cumulative Exposure on Sun Protection Behaviours ........................................... Anna K. Nicholson (AUS)

14:35 – 14:47
Providing Free Sunscreen in Toronto Parks ........................................... Danielle Paterson (CAN)

14:47 – 14:59
The National Council on Skin Cancer Prevention - Creating a United Voice ........................................... John Antonishak (USA)
**Wednesday, May 2 (continued)**

**Afternoon Break** ........................................ 15:00-15:30

**Plenary 2** ......................................................... 15:30-17:00
Environmental Issues in Skin Cancer Prevention (ENG103)
Abstracts on Page 23

**Incorporating Climate Change in Skin Cancer Prevention Interventions**
- Kristie L. Ebi, PhD, University of Washington (USA)
  Respondent: Thomas Tenkate, DrPH, Ryerson University (CAN)

**Towards a Healthy City: The Transformative Power of Urban Design**
- Ken Greenberg, BArch, Greenberg Consultants, Inc. (CAN)
  Respondent: George Kapelos, MArch, Ryerson University (CAN)

**Poster Session 2, Wine & Cheese**  17:00-18:00
(ENG Lower Foyer)
Abstracts on Page 84

**Thursday, May 3**

**Registration Desk**
(ENG 1st Level Foyer)  8:00-17:00

**Plenary 3** ......................................................... 8:30-10:00
New Research Methods for Skin Cancer Prevention (ENG 103)
Abstracts on Page 24

**Applying Geospatial Modeling for Skin Cancer Prevention**
- David Wheeler, PhD, Virginia Commonwealth University (USA)
  Respondent: David Buller, Klein Buendel, Inc. (USA)

**The Essential Need to Protect Health Data: Lead by Embedding Privacy, by Design**
- Ann Cavoukian, PhD, LLD (Hon), MSM, Ryerson University (CAN)
  Respondent: David Whiteman, PhD, QIMR Berghofer Medical Research Institute (AUS)

**Morning Break** ........................................ 10:00-10:30

**Concurrent Session 2** ...................................... 10:30-12:00

**2A - Starting Early: Sun Safety for Children and Schools** (ENG102)
Abstracts on Page 39

- **Introduction**  .................. Lois J. Loescher (USA)
  10:35 - 10:47
- **Sun Protection Practices in Head Start and Day Care Programs in Illinois 2017**  ............ June K. Robinson (USA)
  10:47 – 10:59
- **Using The Uv-Index To Reach Parents Of Young Children With Sun Protective Messages: Evaluation Of An Online Campaign**  ................. Kim Kruijt (NLD)
  10:59 – 11:11
- **Costs of Sun Protection Policy Implementation in California School Districts** ............ Richard T. Meenan (USA)
Thursday, May 3 (continued)

11:23 – 11:35
Determinants of Supportive Sun Protection Behavior of Parents and the Relationship with Sun Protective Behaviour of the Child ........................................... Karlijn Thoonen (NLD)

11:35 – 11:47
Border Students are Sun Safe: Skin Cancer Prevention Education for Hispanic Adolescents Attending Rural, Border High Schools ........................... Lois J. Loescher (USA)

11:47 – 11:59
Solsmart Game - A New App Teaching Kids About Sun Safety ........................................... Solveig Høgh Larsen (DNK)

11:23 – 11:35
To Be Objective or Not: Comparing Reliability of Objective and Self-Report Measures of Sun Exposure in Melanoma Patients................................. Nabil Alshurafa (USA)

11:35 – 11:47
If You Seek It: The Sunsmart App Establishes Sun Protection Habits Among Motivated Users................................. Anna K. Nicholson (AUS)

11:47 – 11:59
seeUV: Using Augmented Reality to Create an Engaging Tool for Today's Sunsmart Generation ................................. Heather Walker (AUS)

2C - UVFX: Skin Cancer & Other Outcomes (ENG106)
Abstracts on Page 48

Introduction ........................................... Lena A. von Schuckmann (AUS)

10:35 - 10:47
The Inverse Relationship Between the Incidence of Solar Induced Eye Disease and Reported Skin Cancer Rates at High Elevation in the Tropical Andes, Ecuador, South America.................. Nathan J. Downs (AUS)

10:47 – 10:59
Sun Exposure Guidelines and Serum Vitamin D Status in Denmark: The StatusD Study ................................................................. Brian Køster (DNK)

10:59 – 11:11
Associations of Statins and Diabetes with Diagnosis of Ulcerated Cutaneous Melanoma .... Lena A. von Schuckmann (AUS)

11:11 – 11:23
The Naked Truth About the Sun - How to Make Sun Protection Entertaining ......................................................... Thomas Koefoed (DNK)

11:23 – 11:35
A Prospective Longitudinal Population-Based Cohort Study of the Natural History of Pigmented Skin Lesions in Adults: Preliminary Baseline Results ................................................................. Monika Janda (AUS)

11:35 – 11:47
Increase in Primary Prevention Behaviour in Organ Transplant Recipients After Sun Protection Education in a Skin Cancer Surveillance Clinic ........ Louisa Gordon (AUS)
Thursday, May 3 (continued)

11:47 – 11:59
Consumer Acceptance and Expectations of a Mobile Health Application to Photograph Skin Lesions for Early Detection of Skin Cancer.......................... Monika Janda (AUS)

Lunch
(ENG Lower Foyer)............................ 12:00-13:30

Poster Session 3
(ENG Lower Foyer)............................ 12:30-13:30
Abstracts on Page 93

Concurrent Session 3.............................. 13:30-15:00

3A - Indoor Tanning Legislation & Regulations (ENG102)
Abstracts on Page 51
Introduction ...................... Anne M. Hartman (USA)
13:35 – 13:47
Evaluating the Stringency and Comprehensiveness of Indoor Tanning Legislation Across Canada .................................................. Sydney Gosselin (CAN)
13:47 – 13:59
Uv Protection in Concrete - Sunbed Regulation in Germany .................................................. Cornelia Baldermann (DEU)
13:59 – 14:11
A Systematic Review of Compliance with Indoor Tanning Legislation .................................................. Jessica Reimann (CAN)
14:11 – 14:23
The Battle for an 18 Years Age Limit for Sunbed Use in Denmark 2007-2017 .................................................. Christine L. Behrens (DNK)
14:23 – 14:35
An Assessment of the First Year of a Ban on the Use of Uv Tanning Equipment (Beds and Lamps) by Adolescents in Ontario, Canada .................................................. Loraine D. Marrett (CAN)
14:35 – 14:47
Inspections of New Regulations for Sunbeds in Norway .......... Sofie Ivara Nicolaissen (NOR)

14:47 – 14:59
Content Analysis of Indoor Tanning Health Warning Labels Across Canada .................................................. Jennifer E. McWhirter (CAN)

3B - Primary & Secondary Prevention Initiatives (ENG105)
Abstracts on Page 55
Introduction ...................... Maria K. Meyer (DNK)
13:35 – 13:47
Skin Cancer Screening Among U.S. Adults, 2000-2015 .................. Meredith L. Shoemaker (USA)
13:47 – 13:59
Association Between Sunburn and Demographic Factors and Health-Related Behaviours Among Danish Students .................................................. Maria K. Meyer (DNK)
13:59 – 14:11
Check Your Skin! Educating the Danes to Perform Self-Skin-Examination .................................................. Solveig Høgh Larsen (DNK)
14:11 – 14:23
Perceptions of Skin Cancer Prevention and Detection by Massage Therapists .................................................. Lois J. Loescher (USA)
14:23 – 14:35
Changes in Sun Protection Behaviour after Diagnosis of High-Risk Primary Melanoma .................................................. Lena A. Schuckmann (AUS)
14:35 – 14:47
Results of the Canadian Dermatology Association Annual Surveys: An Update on Sun Exposure Awareness And Behaviours of Canadians .................................................. Sunil Kalia (CAN)
14:47 – 14:59
Minorities and Skin Cancer Evaluations: A HINTS Analysis .............. Jennifer Nguyen (USA)

3C - Updates & New Considerations on Sunscreen Use (ENG106)
Abstracts on Page 59
Introduction ...................... Anne E. Cust (USA)
Thursday, May 3 (continued)

13:35 – 13:47
Cancers in Australia Attributable to Exposure to Solar Ultraviolet Radiation and Prevented by Regular Sunscreen Use
...........................................Catherine M. Olsen (AUS)

13:47 – 13:59
Sunscreen Use and Melanoma Risk in Young Australian Adults.............Anne E. Cust (USA)

13:59 – 14:11
Sunscreen Application and Vitamin D Status: A Systematic Review....Rachel E. Neale (AUS)

14:11 – 14:23
Sunscreen: An Ambiguous Tool - Findings from an Ethnographic Study Among Danes On Holiday .....Nynne Sahl Frederiksen (DNK)

14:23 – 14:35
How Compliant are Australians with their Use of Sunscreen and Other Sun Protection? ...
...........................................Suzanne Dobbinson (AUS)

14:35 – 14:47
Is it Time to Change Our Public Health Advice in Relation to Sunscreen? 
...........................................Craig Sinclair (AUS)

14:47 – 14:59
How Sunscreens Fit Into UV and Skin Cancer Prevention
...........................................Uli Osterwalder (CHE)

Afternoon Break ..........................15:00-15:30

Plenary 4 ...........................................15:30-17:00
Screening for Skin Cancer Prevention (ENG103) Abstracts on Page 25

Skin Cancer Screening in Germany – Efficacy and Effectiveness
– Alexander Katalinic, MD, University of Luebeck (DEU)

Respondent: Alan Geller, MPH, RN, Harvard University (USA)

Primary Prevention or Early Detection of Melanoma - What Gives Us the Most Bang for the Buck?
– Louisa G. Gordon, PhD, QIMR Berghofer Medical Research Institute (AUS)

Respondent: Monika Janda, PhD, University of Queensland (AUS)

Conference Dinner ......................18:00-22:00
(Hart House Music Room)

Friday, May 4

Registration Desk
(ENG 1st Level Foyer)......................8:00-10:00

Plenary 5 ...........................................8:30-10:00
Issues in Dissemination of Skin Cancer Prevention Interventions (ENG 103) Abstracts on Page 26

Considerations for Scale-up of Evidence-based Skin Cancer Prevention Programs
– Samantha M. Harden, PhD, Virginia Tech (USA)

Respondent: Barbara Walkosz, PhD, Klein Buendel, Inc. (USA)

Policy Development for Skin Cancer Prevention
– Loren Vanderlinden, PhD, Toronto Public Health (CAN)

Respondent: Craig Sinclair, Cancer Council Victoria (AUS)

Morning Break ..........................10:00-10:30
Friday, May 4 (continued)

Concurrent Session 4.......................... 10:30-12:00

4A - On The Job: Sun Protection for Outdoor Workers (ENG102)
Abstracts on Page 64

Introduction ................... Cheryl E. Peters (CAN)

10:35 - 10:47
Estimated Cost of Occupational Sun Protection Policy Intervention Delivery to Public-Sector Employers
............................................. Richard Meenan (USA)

10:47 – 10:59
Solar Ultraviolet Radiation Exposure of Outdoor Workers in Three Canadian Provinces .................. Cheryl E. Peters (CAN)

10:59 – 11:11
Sun Safety at Work Canada
........................................... Thomas Tenkate (CAN)

11:11 – 11:23
Effective Skin Cancer Prevention Programs for Outdoor Workers: Short-Term Outcomes of the Sun Safety at Work Canada Project
........................................... Thomas Tenkate (CAN)

11:23 – 11:35
Sun Smart Lifeguards in Saskatchewan
............................................. Nicole Braun (CAN)

11:35 – 11:47
Formative Research to Develop Sun Safety Ink! (SSI!), a Skin Cancer Prevention Training Program for Tattoo Artists
........................................... Robert Dellavale (USA)

11:47 – 11:59
The Role of Knowledge Brokers in Implementing Effective Occupational Sun Safety Programs
........................................ Lindsay Forsman-Phillips (CAN)

4B - People & Places: Examining UV Exposure and Protection (ENG105)
Abstracts on Page 68

Introduction ................... Martin W. Allen (NZL)

10:35 - 10:47
Sun Smart: Development of a Sun Protection Education Program for Primary Schools
........................................... Bart de Wolf (NLD)

10:47 – 10:59
Parental Sun Protective Behavior During Intentional and Unintentional Sun Exposure: A Longitudinal Study
........................................... Karlijn Thoonen (NLD)

10:59 – 11:11
The Garment Protection Factor (GPF): An Index for Sun-Protective Clothing that Combines Garment Coverage and UVR Transmittance............... Nathan Downs (AUS)

11:11 – 11:23
Clinical Counseling on Sun Protection and Indoor Tanning Avoidance: A Survey of Current Practices....... Dawn M. Holman (USA)

11:23 – 11:35
An Observational Study of a Novel Wearable and Continuous UVA and UVB Sensor in Melanoma Survivors
........................................... June. K. Robinson (USA)

11:35 – 11:47
School-Based Primary Skin Cancer Prevention Programmes Using Real-time Personal UV Data .......... Martin W. Allen (NZL)

11:47 – 11:59
Skin Cancer and UVR Exposure Among Sexual Minorities: Results of a Systematic Review ................... Shannon Brown (CAN)

4C - Prevention Campaigns: New Approaches & Sustained Impacts (ENG106)
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Introduction ................... Lill Tove N. Nilsen (NOR)

10:35 - 10:47
The Value of Strategic PR in Campaigns for Prevention of Skin Cancer
........................................... Christine L. Behrens (DNK)

10:47 – 10:59
Ten Years of the Don’t Fry Day Campaign
........................................... Carolyn Heckman (USA)
Friday, May 4 (continued)

10:59 – 11:11
The Pocket Movie Contest: A Successful Platform for Prevention of Skin Cancer
..........................Christina S. Krüger-Jensen (DNK)

11:11 – 11:23
A National UV and Skin Cancer Strategy for Norway to Resign from the World Melanoma Throne
..........................Lill Tove N. Nilsen (NOR)

11:23 – 11:35
ETSU is “Skin Smart”: Policy Adoption Aimed at Reducing Indoor Tanning Among College Students at a Small Southeastern University
..........................Anthony Peluso (USA)

11:35 – 11:47
‘Help A Dane‘- A Case on How to Involve International Ambassadors in a National Skin Cancer Prevention Campaign
..........................Dorte N. Dahl (DNK)

11:47 – 11:59
The Danish Sun Safety Campaign 2007-2017: Campaign Model and Main Results
..........................Peter Dalum (DNK)

Closing Session/Our Community of Practice
(Public Session)(ENG 103).............12:00-13:30

Session Introduction ..........(George Kapelos)

Screening of the film, "Dear 16 Year-Old Me"
David Cornfield Melanoma Fund
..........................Danielle Patterson, DCMF

Facilitated Panel Discussion: Moving from the Personal to the Public: What Does the Future Hold for Skin Cancer Prevention?
..........................Christine Birak, CBC Radio, National Science Reporter and Host, CBC News (Panel Chair)

• A survivor’s narrative ..........Cathy Telfer

• The Dermatologist’s perspective
..............................................Dr. Jennifer Beecker,
Canadian Dermatology Association

• The Canadian Cancer Society: UV as a Priority at the National Level and Skin Cancer Prevention
..............................................John Atkinson,
Canadian Cancer Society

• The Global Perspective: UV and Global Skin Cancer Prevention
..............................................Emilie Van Deventer,
World Health Organization

Discussion and Questions / Comments from the Floor
..............................................Panel Chair: Christine Birak,
CBC Radio, National Science Reporter and Host, CBC News (Panel Chair)

The Consensus Statement / Conference Closing Statement
..............................................(David Buller & Thomas Tenkate)

First Nation’s Invocation / Closing

After closing, panelists and speakers are to be available to members of the press.
### POSTER SESSIONS

#### Wednesday, May 2

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### Poster Sessions

**Thursday, May 3**

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MONDAY WORKSHOPS

Workshop

SHADE Bootcamp
(Architecture Building) .................................................. 8:00-17:00

Organizer: Toronto Cancer Prevention Coalition / Ultraviolet Radiation Working Group, Toronto Public Health and Ryerson University, Department of Architectural Science

This bootcamp will provide participants with an intense, hands-on opportunity to investigate ways to create shade in public places.

Why shade? Shade is one of the effective means for preventing skin cancer. Skin cancer is caused by exposure to ultraviolet radiation (UVR) and is almost totally preventable. Canadians are encouraged to seek shade during peak UVR hours as one way of preventing this disease. Creating effective shade is an easy, inexpensive and totally accessible way to help prevent this deadly cancer.

The bootcamp is taking place on May 1, 2018, at Ryerson University in Toronto. The bootcamp occurs just before a major conference on skin cancer prevention. It provides an opportunity for participants to engage with experts on shade for skin cancer prevention. Whether you are an architect, landscape architect, urban planner / designer, elected official, municipal administrator, public health practitioner, a person involved with the care of children, landscaper, arborist, owner / operators of recreation facilities, or concerned citizen, the bootcamp examines ways you can create shade in your community to promote health and UVR protection. Global and local experts will be present to exchange ideas on best practices for shade design and policy. Participants will hear about case studies and discuss challenges and opportunities for creating shade in their communities. The centrepiece of the bootcamp is a hands-on exercise that engages all participants in the creation of shade in public places. Attendees will be provided with tools for to developing healthy, sun-safe environments.

There is an additional fee of $100+HST for this workshop*. Lunch is included. To register for this workshop, click here.

Download the full workshop description.
Download the SHADE bootcamp session objectives.

For more information, please contact George Kapelos (gkapelos@ryerson.ca) or Safoura Moazami (safoura.moazami@toronto.ca).

Location: Architecture Building, Ryerson University, 325 Church Street, Toronto

*Registration for this workshop is separate from the 4th International Conference. Please register at the link above.

Workshop

Sun Safety and Skin Health in Youth and Young Adulthood Physical Activity: More Than Just a Little Sunscreen? (George Vari Engineering Building, Ryerson University) .......................................................... 8:30-12:00

The workshop will present the overview of the U.S. National Cancer Institute's interest in skin cancer during physical activity highlighting extant research and research needs. The workshop will be framed as an adaption of social ecological model that considers physical and social environments; perspectives of physically active individuals and organizations/entities that structure and govern physical activity and sports; and implications for intervention and methods/methodology.

Registration is included with your Conference Registration. Pre-registration is required.

For more information about this workshop, please contact the workshop organizer, Frank Perna, PhD National Cancer Institute (USA) at pernafm@mail.nih.gov.

Workshop

Screening for Skin Cancer: Does It Work? If Yes, How? If No, Why Not? (George Vari Engineering Building, Ryerson University) .......................................................... 9:00-15:00

Experiences of the Skin Cancer Screening Education Study (SCSES), Alberta/Canada

Organizers: Association of Dermatological Prevention (ADP), Germany / European Society of Skin Cancer Prevention (EUROSKIN).

Suspicious skin lesions are readily detectable by a visual inspection of the entire body surface which is a safe, non-invasive and inexpensive screening test. Skin cancer is highly curable when diagnosed at an early stage, thus
screening for skin cancer has the potential to reduce morbidity and mortality. However, clear recommendations for routine skin cancer screening of the general adult population are inconsistent among professionals, organizations and countries. The lack of conclusive evidence from high quality epidemiological studies, e.g. from randomized controlled trials, for the effectiveness of population-based skin cancer screening is the main reason for this inconsistency.

Within this workshop we will explore the factors that could lead to a successful screening program (screening procedure, which health professionals should be involved, education of health professionals, communications strategies, evaluation strategies etc.) and discuss whether population-based skin cancer screening is worthwhile. We will illustrate the challenges and issues that we have experienced in conducting skin cancer screening studies, e.g. from the Skin Cancer Screening Education Study (SCSES) in Alberta, Canada, and will also argue for more realistic endpoints other than mortality reduction. The future trends of the use of biomarkers in skin cancer screenings and in the primary prevention of skin cancer will also be presented with results from the latest EUROSkin workshop “Use of biomarkers in primary and secondary prevention of skin cancer”.

Registration is included with your Conference Registration. Pre-registration is required. Lunch will be provided.

For more information about this workshop, please contact the workshop organizer, Prof. Dr. Eckhard W. Breitbart, at info@professor-breitbart.de

Workshop

Online, Mobile, and Social Media Interventions for Skin Cancer Prevention: Lessons Learned in Development, Delivery, and Testing (George Vari Engineering Building, Ryerson University) ........................................................................................................ 10:00-12:00

Organizer: Carolyn Heckman, PhD, Fox Chase Cancer Center

Increasingly, the public is becoming connected to digital resources and social networks. Health professionals and researchers are beginning to take advantage of online, mobile, and social media outlets for intervention and build an empirical foundation for future work. This presentation will provide examples of e/mHealth interventions for skin cancer prevention. The speakers will offer lessons learned in this emerging area of intervention and research.

Registration is included with your Conference Registration. Pre-registration is required.

Workshop

Indoor Tan-Free “Skin Smart Campus” Initiative (George Vari Engineering Building, Ryerson University) ........................................................................................................ 13:00-16:30

The workshop will provide a description and progress of the National Council on Skin Cancer Prevention (USA) “Indoor Tan-Free Skin Smart Campus” initiative and explore how other countries may want to replicate this initiative.

Registration is included with your Conference Registration. Pre-registration is required.

For more information about this workshop, please contact the workshop organizer, John Antonishak National Council on Skin Cancer Prevention at antonishak@skincancerprevention.org.

Welcome Reception (Atrium, George Vari Engineering Building) ........................................................................................................ 17:00-19:00

Kick off the 4th International Conference on UV & Skin Cancer Prevention at the Welcome Reception in the beautiful Atrium Room. The Welcome Reception provides an excellent opportunity to network, catch up with old friends and meet new colleagues. While there is no fee for this event, please ensure to register online so we know you’re coming.
ABSTRACTS

Conference Keynotes

Priority of skin cancer prevention in Canada
- Jennifer Beecker, MD, CCFP(EM), FRCPC, DABD FAAD

Affiliations: National Chair of the Sun Awareness Working Group, Canadian Dermatology Association Assistant Professor, University of Ottawa Research Director, Division of Dermatology, The Ottawa Hospital

Canada may not be a place thought of as a “sunny” destination, but in fact skin cancer affects 1 out of 7 Canadians and remains the most common cancer diagnosed in Canada. The rate of melanoma in Canada continues to rise, particularly among men. Melanoma is one of the 10 most common cancers diagnosed in Canada. From 1992 to 2013, the incidence rates of melanoma went up 2.1% per year for men, and 2.0% for women. The intensity of UVR is highest in the southernmost parts of the country and has increased over the past few decades.

The Canadian Dermatology Association (CDA)’s Sun Awareness Group is working hard to try to change these skin cancer statistics. The CDA has a mandate to not only provide continuing professional development for its members, but to support and advance patient care, provide public education on sun protection, and promote a lifetime of healthier skin.

The Sun Awareness Working Group (SAWG) launches a National Sun Awareness program every year with varying themes to target the issues of the day. Although a nationwide “Sun Awareness Week” is organized in early summer, the activities extend throughout the year. CDA member dermatologists volunteer their time to help with Sun Awareness Events across Canada including public skin cancer screenings, community events, screenings of members of parliament, and partnering with other organizations like TriKids Triathlon and Baseball Canada to promote sun safety. Skin cancer screening events of members of Parliament offer face-to-face time with our country’s policy-makers. More recent campaigns include The Sunglasses Project, a public outreach program to increase awareness of the harmful effects of UV radiation on the eyes. In addition, the CDA’s Sun Protection Program (SPP) recognizes sunscreen products that meet a standard that provides effective sun protection.

Recent major successes in Canada include the banning of indoor tanning devices for youth, where members of the CDA worked with many other organizations, such as the Canadian Cancer Society. The CDA surmounted another major hurdle this past fall when obtaining an exception to Health Canada’s rule forbidding the distribution of sunscreen. This major achievement is allowing the pilot of public sunscreen dispensers in several Canadian communities, with the hope of expansion.

Despite our successes, recent studies show that approximately a third of Canadians aged 18 or older had had a sunburn in the past year, and that adolescents are still interested in tanning. The SAWG is now conducting a yearly survey to track Sun Safety behaviours of Canadians, with the aim of developing need-based targeted messaging and campaigns and measure the impact of our efforts.

Skin Cancer Prevention in the United States - A Public Health Priority - Boris D. Lushniak, MD, MPH, FAAD, FACPM

Affiliations: Dean and Professor, University of Maryland School of Public Health, College Park, MD Former US Surgeon General (Acting) 2013-2014

Public health is defined as the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals (CEA Winslow). This presentation will focus on skin cancer prevention efforts in the US using the public health model of surveillance, risk factor identification, intervention, evaluation, and implementation. It will explore current information on the public health burden of skin cancer, the changing trends in incidence, with the emphasis on public health efforts dealing with prevention including that of indoor tanning. National initiatives including Healthy People 2020, regulatory approaches, and the Surgeon General’s Call to Action to Prevent Skin Cancer will be profiled. The approach as cited in The Call to Action includes five strategic goals: 1) Increase opportunities for sun protection in outdoor settings; 2) Provide individuals with the information they need to make informed, healthy choices about ultraviolet (UV) exposure; 3) Promote policies that advance the national goal of preventing skin cancer; 4) Reduce harms from indoor tanning; and 5) Strengthen research, surveillance, monitoring and evaluation related to skin cancer prevention. Ultimately
success in this public health approach of prevention will be achieved through multicomponent community-wide interventions, education and policy interventions in schools, and education and policy interventions in outdoor and recreational settings.

Plenary 1 - Second Generation Audiences for Skin Cancer Prevention

Overlooked Populations and Populations with Health Disparities for Next Generation Skin Cancer Prevention Experts - Caradee Wright, PhD

Affiliations: Specialist Scientist, South African Medical Research Council (South Africa)

As is the case in many countries around the world, we have seen a rise in non-communicable diseases as a cause of death in South Africa in recent years. In 2015, about 60% of the ten leading underlying natural causes of death were non-communicable diseases, including cancer. Most cancer deaths (60%) were among Black Africans, but the disease seemed to disproportionately affect White South Africans – although this may well reflect better access to healthcare among the latter. Melanoma was ranked 3rd among White South Africans but did not feature in the top 5 cancers among any of the other population groups. The complexities of preventing skin cancers in countries with multi-ethnic populations and wide disparities in inequality, wealth, health and access to health services are challenging. Stark differences exist in the epidemiology of melanoma in the population groups of South Africa. Risk factors vary among population groups and include sun exposure, trauma, human immunodeficiency virus infection, oculocutaneous albinism, age and genetics. Stage of melanoma diagnosis tends to be more advanced in Black Africans than in Whites and survival rates are considerably lower in Black Africans. Several factors probably contribute to these disparities but an important gap to fill is the lack of training for diagnosis and treatment of skin cancers among healthcare professionals in public healthcare settings. Surveillance data are also required, and as is the case in other developing countries, better record-keeping needs to be a key priority.

Fashion and Culture in Skin Cancer Prevention - Jennifer McWhirter, PhD

Affiliations: Assistant Professor of Public Health Promotion and Communication, Department of Population Medicine, University of Guelph (Canada)

Are fashion and culture social determinants of skin health? In this talk we will explore how fashion and culture influence skin cancer-related behaviours and how this knowledge can be used to inform effective prevention efforts. From the ways and reasons skin cancer risk behaviours have changed over time to present-day prevention challenges and opportunities, this plenary lands squarely at the nexus of popular culture and peer-reviewed research. Beauty ideals, celebrity influence, cultural attitudes and beliefs, and the role of mass media will be discussed, among other themes.

Plenary 2 - Environmental Issues in Skin Cancer Prevention

Incorporating Climate Change in Skin Cancer Prevention Interventions - Kristie L. Ebi, PhD, Jennifer Vanos

Affiliations: Rohm & Haas Endowed Professor, Public Health Sciences, University of Washington (USA)

Climate change is changing weather patterns worldwide faster than at any time in the past 10,000 years. Average temperatures are increasing, as are the frequency and intensity of heatwaves and heavy rainfall events. The magnitude and pattern of these changes vary geographically, with particularly rapid temperature increases in the Arctic, but also in parts of the tropics. Although projections are limited, interactions among environmental, social, and economic factors could affect skin cancer prevalence, with the magnitude and pattern of changes varying spatially and temporally. The main pathways are through changes in erythemal irradiance and through changes in human activities and behaviors that could increase or decrease UV exposures and the risk of skin cancer.

Climate change could alter erythemal irradiance, with decreases projected in mid-latitudes and increases in high latitudes. Further, reducing greenhouse gas emissions to address the risks of climate change would improve air quality and reduce aerosols that could increase erythemal irradiance, with aerosols possibly the most important factor for future UV levels over heavily populated areas.
Changes in cloud cover connected to shifts in climate also could affect erythemal irradiance. At the same time, changes in weather patterns due to climate change could alter the prevalence of skin cancers, with increases and decreases possible, depending on the region. Earlier and warmer springs invite people to spend more time outdoors, engaging in leisure-time physical activity in clothing that could increase exposure to UVA and UVB if sunscreen use and other preventive actions (e.g. time spent in full sun vs. in shade) are not taken. This would be expected to markedly increase UV exposure in northern latitudes, with potentially greater impacts in low income populations with less ability to implement sun protection. Increasing summer temperatures and more heatwaves could increase sun avoidance in more southern regions.

Increasing awareness of how climate change could alter the risks of skin cancers is needed among health care providers and the general public to ensure that preventive measures are timely and effective. Increased monitoring and research are needed to improve estimates of UVR exposure, to better quantify UV exposures, and to inform effective modifications of population-based interventions in the face of a changing climate to prevent an increase in skin cancers.

Urban Design and Skin Cancer Prevention

Affiliations: Greenberg Consultants, Inc. (Canada)

The mid-20th century drive towards suburbanisation deprived us of many of the inherent advantages of urban living, resulting in many unintended negative consequences for our health. The realisation of this loss is prompting a re-evaluation of cities and the benefits that good design can bring for health and wellbeing. The challenges of environmental interventions for prevention of skin cancer prevention are many. Projects that reshape the city present opportunities to engage with health-promotive environments. Current work in Toronto are evidence of such engagement.

Creative problem-solving is applied to managing change in all aspects of city building and re-building including land use, built form and public space, municipal infrastructure, transportation and environment. Solutions address the full range of issues contributing to the success and vitality of towns and cities from the grouping of buildings on a single parcel of land to the patterns of a city district, from the renewal of the historic core and the adaptive re-use of obsolescent lands and buildings on urban waterfronts to the creation of new communities on the urban periphery.

At the core of this practice is a deep commitment to improving the lives of people at every level of society. This value has shaped a unique methodology body of work in which urban design goes beyond form to create a context for social connection, economic vitality, and environmental sustainability; in which the specific and authentic qualities of the local place focus and ground design strategies; in which public and private interests cooperate across traditional boundaries to create mutual benefit for their cities; and in which the examined interaction of infrastructure, individual parcels and blocks, and the public realm sets a liberating context for great architectural and landscape design.

Great stress is placed in all assignments on the crafting of strategic frameworks that give clear urban design over time while fostering creativity of a range of participants and allowing for desirable margins of flexibility.

Plenary 3 - New Research Methods for Skin Cancer Prevention

Applying Geospatial Modeling for Skin Cancer Prevention

Affiliations: Associate Professor, Virginia Commonwealth University (USA)

Solar ultraviolet radiation (UVR) represents the strongest environmental risk factor for the development of most skin cancers. A number of experimental and epidemiological observational studies have identified and assessed the harmful effects of UVR exposure on melanoma, basal, and squamous cell carcinomas. Individual exposure to ultraviolet radiation is challenging to measure, particularly for cancers with substantial latency periods between first exposure and diagnosis of outcome. As a result, epidemiological research of UVR induced diseases have relied on retrospective, self-reported time outdoors, static ecological-type variables such as latitude of residence, or UV indices as surrogates for long-term personal UVR exposure. However, these methods present substantial limitations because of poor-to-fair reproducibility or untested validity. Several recent epidemiological studies have used geographical information system (GIS) satellite estimates of ambient
UVR to provide exposure estimates that also take into account time of year, elevation, and cloud cover at a particular location. In addition to satellite data, a number of databases collect localized meteorological parameters such as temperature and rainfall. In addition to influencing ambient UVR, weather may impact personal UVR exposure by affecting an individual’s proclivity to spend time outdoors. Other work has attempted to explain objectively-measured personal UVR exposure using individual characteristics and environmental/meteorological factors to guide the choice of surrogates for long-term UVR exposure in epidemiologic studies. Research findings show that ambient UVR, latitude, and daily rainfall are the strongest environmental predictors of daily personal UVR exposure. More recent work uses downscaling to produce finer spatial scale estimates of UVR to link to individual locations. In this talk, I will review the GIS methods used in these studies and describe how spatial analysis methods can be used to estimate UVR exposure and evaluate its association with skin cancer. These spatial analysis methods can be used to identify where UVR exposure and skin cancer risk is highest.

The Essential Need to Protect Health Data: Lead by Embedding Privacy, by Design - Ann Cavoukian, PhD, LLD (Hon), MSM

Affiliations: Ryerson University (Canada)

Privacy is presently under siege. With the growth of ubiquitous computing, online connectivity, social media, wireless/wearable devices, and concern over the direction of Artificial Intelligence, people are being led to believe they have no choice but to give up on privacy. This is not the case! A privacy framework called Privacy by Design will enable our privacy and our freedom, to live well into the future. Dr. Cavoukian dispels the notion that privacy acts as a barrier to data utility, health research, security or innovation. She argues that the limiting paradigm of “zero-sum” – that you can either have privacy or innovation, but not both – is an outdated, win/lose model of approaching the question of privacy in the age of massive surveillance of citizens. Instead a “positive-sum” solution is needed in which the interests of both sides may be met, in a doubly-enabling, “win-win” manner through Privacy by Design (PbD). PbD is predicated on the rejection of zero-sum propositions by proactively identifying the risks and embedding the necessary protective measures into the design and data architecture involved. Her new “AI Ethics by Design” explores the need to proactively embed an ethical framework on AI developments, in order to maximize the gains: win/win is always the goal! Dr. Cavoukian will outline how organizations can embed privacy and data utility into virtually any system or operation, to achieve positive-sum, win/win outcomes, enabling both privacy and much-needed research – not one at the expense of the other. We can do this!
Now a discussion is needed how to improve the current situation. An improvement of the screening modalities is needed as well as the generation of new evidence for skin cancer early detection.

**Primary Prevention or Early Detection of Melanoma – What Gives Us the Most Bang for the Buck? - Louisa G. Gordon, BEc, MPH, PhD**

**Affiliations:** Team Head of Health Economics, QIMR Berghofer Medical Research Institute (Australia)

Sun protection strategies are effective at reducing skin cancers. However, changing behaviours at the population-level is difficult and attracting public investment for sun protection programs is challenging when most benefits accrue in the future. Conversely, while screening for melanoma has short-term appeal, it can lead to over-diagnosis, over-treatment and attendant high costs. Using health economic modelling, we compared the outcomes of primary prevention versus early detection over the long-term, to guide policy decisions. A Markov health state transition model was constructed to estimate the projected costs, numbers of melanomas, survival and quality-adjusted life years in a cohort of men and women aged 50 years, for their remaining life. Two mutually exclusive scenarios were compared: 1) urging daily sunscreen use (primary prevention), and 2) clinical whole-body skin checks following skin self-examinations (early detection). Published costs, epidemiological and randomized trial evidence (i.e. Nambour Skin Cancer Prevention Trial) in Queensland, Australia populated the model. The flow-on impacts for managing keratinocyte skin cancers were included as were current advances in survival and costs for targeted melanoma therapies. Detailed sensitivity analyses were undertaken to gauge the stability of the findings. This talk will present the findings of these analyses and demonstrate the trade-offs between healthcare spending and health gains.

**Plenary 5 - Issues in Dissemination of Skin Cancer Prevention Interventions**

**Considerations for Scale-up of Evidence-based Skin Cancer Prevention Programs - Samantha M. Harden, PhD**

**Affiliations:** Human Nutrition, Foods, and Exercise, Virginia Tech, Blacksburg, VA (USA)

Dissemination and implementation science has emerged from a variety of fields to answer the questions of how, what, where, when, for whom, and why an intervention works. This long list of factors that impact the ability of an intervention to scale to new populations and/or settings is not easy to capture, manipulate, measure, and disseminate. In this keynote address, a participatory approach to planning and evaluating evidence-based interventions will be discussed. Specifically, this integrated research-practice partnership approach has been used to scale two statewide physical activity programs in a pragmatic setting. Successes and pitfalls related to the processes and outcomes will be discuss based on the RE-AIM (reach, effectiveness, adoption, implementation, and maintenance) framework. Applying this framework in an iterative way allows both researchers and practitioners to engage in decision-making throughout the intervention. Further, the focus will be on data collection, interpretation, and sharing. In “real world” intervention work considerations related to capturing data, determining resources available for data gathering (e.g., who will collect the data, veracity of the data), and, ultimately, interpretation of the data to impact decision making are as challenging as the behavioral or mechanistic underpinnings of the intervention itself. This keynote will highlight the need for mixed-methods data to inform decision making across multiple levels of intervention (e.g., patients, communities, policy). These pragmatic considerations are imperative for the scalability of skin cancer prevention interventions.

**Policy Development for Skin Cancer Prevention - Loren Vanderlinden, PhD**

**Affiliations:** Manager, Healthy Public Policy, Toronto, Public Health (Canada)

As the largest public health unit in Canada, Toronto Public Health (TPH) promotes and protects the health of 2.8 million people in the city of Toronto. The TPH Strategic Plan identifies “championing healthy public policy” as a priority direction that supports our ability to meet the vision of “A Healthy City for All”. Policy development is also identified as a core public health function in the Ontario Public Health Standards which guide our work.

TPH is a municipal leader recognized nationally for its development and implementation of public policies that foster wellness and protect the public from preventable threats to health. Our approach to policy development
draws upon the wisdom of different frameworks, identifying distinct policy stages that flow from identifying the issue, gathering evidence, developing policy options, stakeholder and community engagement, recommending an approach for decision, through to implementation and monitoring. At the same time, we recognize from extensive practical experience that the policy “cycle” is rarely a linear, systematic process. Our hybrid model conceptualizes policy development as dynamic and iterative, with linkages between stages, components that occur and repeat throughout the entire process, and as situated within a broader context. These observations apply across all stages of the cycle, however, where they are arguably most germane to our ability to make an impact on health is in the realm of policy implementation. Public health practitioners note that “a gap remains between the development of evidence-based public health interventions and their successful implementation” and have begun to pay closer attention to why some public health interventions are successfully implemented, where others are not.

This plenary presentation will briefly outline the TPH approach to policy development, focusing on observations regarding the factors related to successful policy implementation. These observations will be drawn from current published evidence seeking to support this area of inquiry and from select case studies of TPH policy work including the Toronto pesticide bylaw, menu labelling, smokefree entrances bylaw, and prudent avoidance policy for cell tower siting.

Concurrent Session 1A - Trends in Indoor Tanning and Tanner Behavior

Artificial tanning devices: public health interventions to manage sunbeds - Emilie Van Deventer2, Craig Sinclair1

Affiliations: 1Cancer Council Victoria, Melbourne, VIC, Australia, 2World Health Organisation, Geneva, Switzerland

Introduction - Over the past three decades there has been an increase in the use of artificial sources of UVR in the form of artificial tanning devices, such as sunbeds, stand up booths and facial tanners. This deliberate exposure to UVR for cosmetic purposes is increasing the incidence of the major types of skin cancer, and driving down the age when skin cancer is first diagnosed.

Methods - Best practice examples of policy interventions from around the world are brought together in a new WHO resource Artificial tanning devices: public health interventions to manage sunbeds. This new report, developed after extensive consultations worldwide, outlines the policies undertaken by countries to regulate sunbeds to either ban them outright or limit and manage their use. It is summarized in a set of infographics available in several languages. Complementary to this document, a new WHO database has been established that compiles the type of sunbed interventions that have been implemented by countries across the world.

Results - There are many effective policy interventions governments can choose to reduce the negative health impacts of sunbed use. This can include, for example, introducing additional taxes, requiring health warnings and controls to manage risks, educating users, limiting access or even banning sunbeds outright. This presentation will highlight the breadth of policy options that countries have undertaken and identify the policy interventions that have had the most impact in terms of reducing skin cancer risks.

Conclusion - By effectively controlling the management of sunbeds, governments can have a significant influence on skin cancer rates and mortality. Designing and implementing policies and programmes to enable health lifestyle choices are critical to reducing the non-communicable disease burden and achieving the United Nations Sustainable Development Goal (SDG).

Learning Objectives:

• To raise awareness of the various policy interventions that can be effective in reducing the health risks associated with sunbed use.
• To provide an analysis of some of the country specific interventions that have been effective.
• To introduce the audience to the new WHO Global sunbeds policy database that documents all the policy interventions by country.

Skin Cancer Projections 2007-40 from reduced Sunbed Use and Sunburn 2007-15 in the Danish Population - Brian Koster, Maria Meyer, Peter Dalum

Affiliations: The Danish Sun Safety Campaign, Danish Cancer Society, Copenhagen, Denmark

Introduction - Exposure to ultraviolet radiation is the main risk factor for skin cancer. Sunburn and sunbed use is...
associated with an increased risk of malignant melanoma (MM) and keratinocyte cancers (SCC, BCC). In 2007, a long term sun safety campaign was launched in Denmark which decreased the sunbed use and sunburn prevalence in the Danish population by respectively 18 % and 3 % annually during 2007-15. We have modelled future effects of the reduction in sunburn and sunbed use 2007-15 on MM, SCC and BCC incidences 2007-40.

Methods - Skin cancer incidences were modelled in the Prevent program, using population projections, historic cancer incidence, prevalence of sunbed use/sunburn and relative risk of sunbed use and sunburn on melanoma, basal cell carcinoma and squamous cell carcinoma, respectively. A conservative scenario was applied which assumed the campaign was terminated in 2015 and that prevalence of sunbed use and sunburn reversed to 2007 levels during 2015-23. Sensitivity scenarios of time from campaign intervention to effect of intervention, incidence trends and relative risks were applied.

Results - The campaign results from 2007-15 are estimated to reduce the number of skin cancer cases with 14284 totally during 2007-40. Of those 2485 were MM, 3623 SCC and 8176 BCC. The number of avoided cancer cases from decrease in sunburn and sunbed use, respectively are 4024 and 10390. The reduction corresponds to a decrease of more than 2 % of all skin cancer cases.

Conclusion - We have shown the value of prevention and the value of long term planning in prevention campaigning. The decrease in sunbed use and sunburn during 2007-15 will have reduced future skin cancer incidence significantly. A continued campaign pressure is crucial in maintaining prevalence of sunbed use and reducing sunburn prevalence further.

Learning Objectives: In this presentation we show:

• a prediction of the future number of skin cancer cases based on development in the risk factor and demography of the population
• huge potential in continued interventions against sunburn and sunbed use.

Indoor Tanners Who Tan in Fitness Centers
- Sherry Pagoto1, Vinayak Nahar1, Christine Frisard3, Stephanie C. Lemon1, Joel Hillhouse4, Jessica Oleski1

Affiliations: 1University of Connecticut, Storrs, CT, USA, 2Lincoln Memorial University, Harrogate, TN, USA, 3University of Massachusetts Medical School, Worcester, MA, USA, 4East Tennessee State University, Johnson, TN, USA

Tanning beds can be accessed in many locations besides tanning salons. Research has revealed that nearly half of fitness centers in Canada offer tanning beds (Huang & Kirchhof, 2017). In the US, two of the largest national fitness center chains (e.g., Planet Fitness, Anytime Fitness) offer free indoor tanning with membership. Little is known though the proportion of tanners who tan in fitness centers and whether these tanners are different from those who tan in other locations. The present study examined the proportion of tanners who tan in fitness centers among a national sample of 636 people who report to have tanned indoors at least once in their life. These two groups of tanners were compared on gender, age, tanning frequency, and likelihood of being tanning dependent. Findings revealed that 24% (n=154) of tanners had tanned at least once in a fitness center and 29% (n=44) of those tanners reported primarily tanning at a fitness center. People who had tanned in a fitness center were younger than other tanners (mean=33.40 sd=9.75; mean=37.11, sd=13.59; p=0.0002), more physically active (mean=3.85 days per week, sd=2.14; mean=2.73 days per week, sd=2.14; p <.0001), but did not differ by gender (p=.78). People who have tanned in a fitness center reported more tanning in the previous year (mean=18.57 visits; sd=22.63 versus mean=13.56 visits; sd= 20.22; p=.01) and were more likely to be at risk for tanning dependence (47% vs 33%; p=.002). Over half (56%) of people who tanned in a fitness center said tanning in locations other than salons allows them more control over the duration and frequency of their tanning visits. Prevention efforts should target fitness center patrons given their riskier tanning habits. Research should explore whether the pairing of tanning beds and fitness centers reinforces perceptions that tanning is part of a healthy lifestyle.

Learning Objectives:

• To understand the variability in locations in which people use tanning beds.
• To understand the characteristics of tanners who tan in fitness centers.
• To learn ways to reduce indoor tanning by targeting fitness centers.
Tanning equipment use: 2014 Canadian Community Health Survey - Sami S. Qutob, Michelle O’Brien, Katya Feder, James McNamee, Mireille Guay, John Than

Affiliations: Health Canada, Ottawa, ON

Background: Tanning equipment use is related to the early onset of cancer, with the risk increasing as the duration and repetition of exposure increase. In 2009, the International Agency for Research on Cancer classified tanning equipment use as carcinogenic to humans, and according to the World Health Organization, the risk of skin melanoma increases significantly when use begins before age 35.

Data and Methods: The rapid response component of the 2014 Canadian Community Health Survey collected data on the use of tanning equipment in the previous 12 months, including reasons for use, frequency/duration of use, precautions taken, and adverse reactions or injuries. This analysis examines the prevalence of self-reported indoor tanning in a nationally representative sample of Canadians aged 12 or older in the 10 provinces.

Results: In 2014, 4.5% of Canadians (an estimated 1.35 million) reported that they had used tanning equipment in the past year; 70.3% of them were female, and just over half of female users were aged 18 to 34. The prevalence of indoor tanning was highest among people with some postsecondary education and among those in higher income households (trend p-value ˂ 0.0001). Most users reported fewer than 10 sessions in the past year. The most common reason (62.0%) was to develop a “protective” base tan.

Interpretation: Females made up the majority of tanning equipment users, particularly at ages 18 to 34. Efforts to increase awareness of the risks may be beneficial, given the high percentage of users who believed that indoor tanning offers some level of skin protection from future sun exposure.

Learning Objectives: The Health Effects & Assessment Division generated questions to be used in the 2014 rapid response component of the CCHS to collect data on tanning equipment usage among Canadians in the previous 12 months, including reasons for tanning equipment usage, frequency / duration of use, precautions taken, and any adverse reactions or injuries:

- to evaluate the effectiveness of HC’s tanning label requirements and establishing a baseline for evaluating the effectiveness of the new tanning labels in the future,
- to collect data that will inform our risk assessment,
- collect data that will permit strategic planning for the bureau and prioritization of future work.

Health Behavioral Correlates of Indoor Tanning in a National Sample of Parent-Adolescent Dyads from NCI’s FLASHE Study - Kasey Morris, Carolyn Heckman, Frank Perna

Affiliations: ¹Fox Chase Cancer Center, Philadelphia, PA, USA, ²National Cancer Institute, Bethesda, MD, USA

Introduction: Indoor tanning, physical activity, and both healthy and unhealthy dietary practices possess some common motivations, such as a desire for appearance enhancement. The US National Cancer Institute conducted the Family Life, Activity, Sun, Health, and Eating (FLASHE) Study to examine multiple cancer-relevant behaviors such as these within a national sample of parent-adolescent dyads.

Methods: The FLASHE study included web-based surveys administered to dyads of parents and their adolescent (aged 12-17 years) children. The sample, derives from a consumer opinion panel drawn to be representative of the US population. Data for the current study includes 1,793 parents (72.2% female) and 1,661 adolescents. Associations between indoor tanning and physical activity, dietary behaviors, and related variables were examined using logistic regression.

Results: Individuals who indoor tanned at least once in the past year included 3.4% of adolescents (n=55) and 5.8% (n=103) of parents. In preliminary analyses conducted separately for adolescents and parents, daily detrimental food intake (junk foods such as sweets or potato chips) was significantly associated with an increased likelihood of indoor tanning (adolescents, OR=1.08, p=.035; parents, OR=1.13, p<.001). Daily intake of beneficial foods (e.g., fruits and vegetables) and physical activity were not significantly associated with indoor tanning. Other variables associated with indoor tanning among adolescents were being teased about weight (OR=1.40, p=.008) and smoking (OR=14.51, p<.001), and among parents were being physically active to maintain appearance (OR=1.62, p=.002) and smoking to lose weight (OR=5.79, p<.001).

Conclusions: Indoor tanning was associated with unhealthy eating, smoking, and other issues related to weight and appearance among adolescents and parents. This presentation will discuss potential reasons for these
associations with indoor tanning, including desire for appearance enhancement, peer pressure, and hedonic correlates. Dyadic analyses examining linked adolescent and parent data will also be presented.

Learning Objectives:
• Attendees will be able to describe the basic methods of the FLASHE study and how to access FLASHE data for their own use.
• Attendees will be able to describe the nature of associations between indoor tanning and other key variables among parents and adolescents.
• Attendees will be able to provide potential explanations for associations between indoor tanning and other key variables among parents and adolescents.

When the Path to a Natural Look is Artificial - Findings from a Qualitative Study of Young Female Frequent Sunbed Users - Nynne Sahl Frederiksen, Anne Friis Krarup

Affiliations: Danish Cancer Society, 2100, Denmark

Introduction: Sunbed use is associated with an increased risk of melanoma. Recent surveys have shown a rise in the proportion of female Danish 15-25 year olds, who use sunbeds. This presentation highlights findings from a qualitative study of risk assessments and motivations for indoor tanning among young female sunbed users.

Methods: Data consists of semi-structured interviews with ten female informants aged 17-20. The informants attended general or vocational secondary education and were all ethnic Danes. The informants lived in different parts of Denmark representing both urban and rural areas. The behavioural inclusion criteria were indoor tanning at least once a month.

Results: The female sunbed users all had a short-term risk perception regarding their use of sunbeds. Although they had some knowledge about the serious risks of indoor tanning, they had difficulties conceptualizing the relative risk of melanoma as a personal risk, and were more concerned about the cosmetic consequences such as freckles and wrinkles. Cosmetic consequences were not necessarily perceived as permanent, as cosmetic treatments or surgery was considered an option. Looking good was the dominant motivation for indoor tanning. The majority were insecure about their appearance, and felt tanning helped them look healthier and come closer to a natural ideal of beauty. They felt unattractive with their natural skin tone, and stated they needed to wear more makeup to cover paleness and blemishes if they did not tan.

Conclusion: Although the informants utilized artificial methods such as indoor tanning, makeup and ultimately were willing to engage in cosmetic surgery, they were motivated by a natural beauty ideal with less makeup. Having a tan made it possible for the informants to feel naturally beautiful, because a tanned skin tone gave them the confidence to wear less makeup and feel comfortable in their own skin.

Learning Objectives: This presentation will cover:
• An anthropological approach to young frequent female sunbed users' lifeworld and drivers for indoor tanning
• Insights about frequent sunbed users’ risk perception and risk assessments concerning indoor tanning
• Insights into female sunbed users’ ideals of beauty
• Demonstration of the benefits of ethnographic methods to get an in-depth understanding of target groups’ point of view, and thereby strengthening our abilities towards creating effective interventions for preventing melanoma
• The key findings’ practice implications and recommendations for future interventions.

The Prevalence and Correlates of Heavy Indoor Tanning, Tanning Addiction, and Perceptions of Tanning Cessation - Jerod L. Stapleton, Zhaomeng Niu, Veenat Parmar

Affiliations: Rutgers, The State University of New Jersey, New Brunswick, NJ, USA

Introduction: Artificial ultraviolet-emitting indoor tanning beds are used by millions of Americans each year. Some of these tanners engage in frequent, heavy tanning and may experience symptoms of a behavioral addiction to tanning. Unfortunately, the experiences and intervention needs of heavy tanners are poorly understood. Study objectives were to (1) examine the prevalence of heavy indoor tanning, symptoms of tanning addiction, and tanning-related problems among recent tanners and (2) examine the association of heavy and addicted tanning behavior with perceptions of openness to tanning cessation and perceived difficulty in quitting tanning.

Methods: Survey data was collected from a sample of 919 undergraduates recruited from a large university in
the northeastern United States. Measures included the Behavioral Addiction Indoor Tanning Screener and tanning-adapted measures of readiness to change, cessation perceptions, and perceived difficulty in reducing tanning.

Results: Heavy tanning (i.e., tanning 20 or more times in the past year) was reported by 3.1% of participants and 25% of past year tanners (n=28). Symptoms of tanning addiction were reported by 2.1% of participants and 35.7% of heavy users (n=19). Nearly 2/3 of both heavy tanners and addicted tanners indicated a desire to reduce or quit tanning if they could do so easily. However, less than 1/3 of heavy and addicted tanners intended to take steps to reduce tanning in the near future. Perceived difficulty in quitting was highest among addicted tanners. In regression models, tanning-related problems, tanning addiction, and past year tanning were significant predictors of perceived difficulty in quitting tanning.

Conclusions: Findings suggest that heavy and addicted tanners are open to tanning cessation but may lack the skills required to successfully quit tanning. There is a need to develop intervention programs geared specifically toward this group that can both build motivation to quit tanning and enhance cessation self-efficacy.

Learning Objectives:
- To identify the characteristics associated with symptoms of tanning addiction
- To identify factors that may be associated with openness to tanning cessation
- To learn about potential intervention and cessation approaches for heavy tanners.

Concurrent Session 1B - Perspectives on Shade and Environmental Design

ShadePlus: A Study of Health-Related Effects of Park Refurbishments Including Shade - Suzanne Dobbins1, Jenny Vietch2, Jo Salmon3, Melanie Wakefield1, Petra Staiger3, Robert MacInnis1, 4, James Chamberlain1, Jody Simmons1

Affiliations: 1Cancer Council Victoria, Melbourne, VIC, Australia, 2Deakin University, Institute of Physical Activity and Nutrition (IPAN), School of Exercise and Nutrition Sciences, Geelong, VIC, Australia, 3Deakin University, School of Psychology, Faculty of Health, Geelong, VIC, Australia, 4University of Melbourne, Centre of Epidemiology and Biostatistics, Melbourne, VIC, Australia

Introduction: Modifying the park environment offers a promising strategy to promote physical activity, yet there is a paucity of data on the impact of these interventions on sun protection outcomes. Parks in lower socio-economic (SES) areas of outer Melbourne typically have few amenities (including shade). Study objectives were to examine the health-related effects of ShadePlus, an intervention introducing shade, walking paths and other facilities to parks in low SES areas.

Methods: Using a natural experimental design, in partnership with Brimbank City Council three intervention parks (prescheduled for refurbishment) and three comparison parks (matched on size, and suburb features) were selected for study. Outcomes were assessed in spring-summer months before (T1: 2013-2014) and after (T2: 2014-2015) the intervention, and at follow-up (T3: 2015-2016). A broad range of outcomes were measured via observations in the parks, and self-report surveys of park visitors. All analyses adjusted for clustering within parks.

Results: Observed mean counts of park visitors increased significantly at intervention parks from pre-test to post-test relative to comparison parks (T1: Ix=282, C=275; T2: Ix=510, C=283; p=0.018), but the effect was reduced at follow-up (T3: Ix=405, C=304; T1 to T3, p=0.311). Although, observed counts of park visitors who were moderately/vigorously active and those using shade increased at intervention parks after refurbishment, these increases were not statistically significant relative to comparison parks (T1 to T2 p=0.146 and p=0.156, respectively). There was little change in participants’ reported mental well-being (PANAS scores T1 to T2, p=0.619 and p=0.234

Conclusions: These initial findings demonstrate that refurbishments including shade attracted more users to the parks, but decreased by the second spring-summer after completion. Although more convincing evidence of sun protection and physical activity benefits of park refurbishments may be required for future investments, further analyses and qualitative findings may reveal other benefits.

Learning Objectives:
- To build knowledge on studies of park refurbishments including shade
- To describe the impact of park refurbishments in a lower SES area on park use during spring-summer months;
• To quantify the extent to which improvements in physical activity levels, sun protection and mental well-being of park users might be expected following park refurbishments.

Conducting a Shade Audit in Saskatoon, Saskatchewan - Nicole Braun

Affiliations: Saskatchewan Cancer Agency, Sun Smart Saskatchewan, Saskatoon, SK

Introduction: In the summer of 2016, Sun Smart Saskatchewan piloted a shade audit project at a popular destination along Saskatoon’s riverfront in order to: a) demonstrate the process for conducting a shade audit, b) highlight positive features and make recommendations for improvements at the site, and c) raise awareness about designing outdoor spaces with shade in mind.

Methods: Sun Smart Saskatchewan engaged a local landscape architecture and urban planning firm to conduct the shade audit. Auditors were on site for a total of 20 hours over 8 days between July 25th and August 6th, 2016. The shade audit site featured a splash pad, pavilion with concession, promenade, and amphitheater. Auditors completed a site inventory to assess the physical site features, including the ground surface material and shade from natural and constructed sources. Auditors conducted interviews with site visitors and observed and recorded behaviour using an online application called Device Magic.

Results: Shade was found to be lacking where it was needed most: for children and their caregivers around the splash pad. Children (including babies and teens) made up one third of total site visitors. Families (defined as any group with at least one child) represented 40% of groups observed. 75% of the people interviewed said there was a need for more shade at the site. Of those who said more shade was needed, 52% specified that the splash pad in particular needed more shade.

Conclusion: Individuals can take their own precautions to protect their skin, but shade offers passive, universal protection. It’s skin cancer prevention by design. The shade audit report produced will be used as an engagement tool with municipalities and other stakeholders.

Learning Objectives:
• Describe the steps involved in a shade audit process, including site selection, behavioural observations and environmental observations
• Assess shade audit findings
• Describe shade planning principles
• Discuss stakeholder engagement.

Sun-shading in Public Spaces: A Survey of Twelve European Projects - Christina Mackay

Affiliations: School of Architecture, Victoria University of Wellington, Wellington, New Zealand

The author is an architect and academic who has researched sun-shading for UV protection for over a decade. Her homeland, New Zealand, has high rates of skin-cancer due to its fair-skinned population enjoying an outdoor lifestyle in a temperate island climate with relatively high UV levels. A 2016 study of six public built shade projects found that permanent transparent or translucent shading materials were used to create comfortable ‘warm shade’ to suit the climate. This result raised the question of ‘how other fair-skinned populations were designing their shaded public spaces?’

A review of international architectural journals and websites (2012 to 2016) identified 170 projects. In May and June 2017, the author travelled in Norway, Denmark, Belgium, Italy, Croatia, Slovenia and Switzerland surveying selected public shade projects and interviewing architects involved in their design. The designs of twelve pavilions or canopies were analysed, using site and climate data, to estimate their performance in providing sun protection, comfort and shelter.

Strategies for building shade were found to vary in relation to climate. In Copenhagen, a large geodesic dome clad in polycarbonate provided shelter from winter rain and created a warm UV protected space on sunny days. In Ghent, an open ‘Market Hall’ functioned as a public living space throughout the year. An array of glass tiles lightened its grand roof and the interior. In two cases, retractable tensile canopies were extended seasonally to give shelter from both rain or sun. Two summer pools in Switzerland offered their patrons a variety of activities and shade quality. On the Riva waterfront in Split, the municipality fostered civic-scale sunshade canopies over outdoor dining.
Generally, shade projects were estimated to provide adequate UV protection for the site and its use and in all cases their presence enriched public life.

Learning Objectives:

- To find examples of how public sun-shading is provided in Europe
- To observe how sheltered covered public space is used by the public
- To analyse how different outdoor shelters modify comfort and UVR exposure.

Shade vs Shadow: The Conflict Between Access to Daylight and UVR protection, Whither Urban Policy?
- George T. Kapelos¹, Matthew Sweig²

Affiliations: ¹Ryerson University, Toronto, ON, ²Forest and Field Landscape Architecture, Toronto, ON

This presentation addresses two policies of the City of Toronto concerning public health and building design. Toronto's Board of health (BoH) has a policy to provide shade in public places in order to protect citizens from the harmful cancer-causing effects of ultraviolet radiation (UVR). In the new Downtown Secondary Plan, Toronto's Planning Department is advocating that no tall buildings be built that overshadow public places. Access to daylight must be a significant consideration for any new development. Health-promoters talk about the necessity of “shade” for chronic disease prevention. Planners talk about access to daylight. Developers have jumped on the apparent contradiction of these two policies to argue that the very tall buildings they are proposing will provide healthy shade. Evidence shows that well placed shade for skin cancer prevention is not the same as the shade that tall buildings may provide in public places. Developers are winning their case at the Ontario Municipal Board with the result that parks are being overshadowed, while good, healthy shade is not being created. As Toronto grows and rewrites its policies, professionals in Toronto’s divisions of Public Health (TPH), City Planning (TCP), Parks, Forestry and Recreation (TPF&R), and the Toronto Cancer Prevention Coalition (TCP) see this as a serious issue. This presentation addresses the policy question of healthy shade versus access to daylight in public places. It will present research findings that seek to clarify definitions of “shade” versus “shadow” to aid in the creation of health-promoting environments.

UV Radiation and Urban Shade Trees: How Much Protection Can They Provide Us? - Janani Sivarajah, Sandy Smith, Sean C. Thomas

Affiliations: University of Toronto, Faculty of Forestry, Toronto, ON

Introduction: Trees provide natural shade and protect humans from solar ultraviolet radiation, and have the potential to reduce UV exposure during childhood especially with the recent emphasis on outdoor activity. Traditional shading structures reduce UV exposure by reflecting solar radiation, however, unlike trees, they do not usually absorb or decrease UV radiation reaching the ground. Little quantitative data exist on how tree shading affects penetration of solar erythemal UV radiation (i.e. erythema or skin burning). To date, most studies have focused on the measurement of UV-A radiation within Australian tree canopies, with few measuring UV-B radiation or UV-C. As part of a broader effort to understand the shade value of trees for human health, we measured the penetration of erythema-causing UV radiation (220 to 320 nm) under common tree species found in the temperate zone of Toronto.

Methods: Solar UV radiation exposure data were collected using electronic dosimeters under 14 tree species (n=56) in urban schools and public parks. The dosimeters were placed under each tree using PVC tubes at the same height as a small child. The study was carried out daily during high exposure times.

Results: Results show differences among UV penetration beneath the crowns of different tree species. The standard erythemal dosage (SED - J/m²) ranged from 1.2 to 3.4 SED, and among the 14 species tested, Acer platanoides, Ginkgo biloba, and Pinus nigra showed the least amount.
Relevance: We highlight the importance of urban shade trees for human health, and provide information on the best species for protection. These results can help support landscape designs to increase canopy cover in building strong outdoor environments.

Learning Objectives:

- To learn the extent of UV protection offered by urban shade trees
- Identify the best and worst urban tree species for human health
- To gain information to build strong outdoor environments.

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**Alliance for UV Protection: Prevention of Health Damage Caused By The Sun - Structural Prevention in Urban and Rural Areas - Cornelia Baldermann**

**Affiliations:** German Federal Office for Radiation Protection, Neuherberg, Germany

The number of UV radiation induced skin cancer diseases continues to rise in Germany as well as worldwide. Climate change is further exacerbated the situation. This can and must countered with effective prevention measures. It is becoming increasingly apparent that behavioral prevention measures need to be complemented by structural prevention measures for effectively minimizing the skin cancer risk. The living and working environment of people should be designed in such way that all who are outdoors have an opportunity to avoid high UV exposure - and heat stress as far as this is possible with UV-minimizing measures. In Germany, structural prevention measures are already applied here and there. However, a holistic approach urgently needs the nationwide establishment of structural prevention measures. To achieve this, superordinate structures and / or guidelines have to be created as a basis for concrete on-site measures.

- Climate change is also the cause for more high temperature days with increased morbidity and mortality. Some UV exposure minimizing measures can also reduce heat stress. Thus, with one measure two harmful health environmental factors outdoors (UV and heat stress) can actively be addressed.

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**Partners in Action: Integrating Shade Design in Public Places for Cancer Prevention - Adrina Bardekjian¹, Safoura Moazami², George Kapelos³**

**Affiliations:** ¹Toronto Cancer Prevention Coalition, Toronto, ON, ²Toronto Public Health, Toronto Cancer Preventional Coalition, Toronto, ON, ³Ryerson University, Toronto, ON

Social media is a key tool in promoting cancer prevention. The provision of shade is one of the key methods of preventing skin cancer, caused by environmental ultraviolet radiation. Public policy to support the creation of shade is one component of skin cancer prevention. The Toronto Cancer Prevention Coalition Ultraviolet Radiation Working Group (TCPC – UVRWG) successfully put shade on the city’s cancer prevention agenda. Consequently, Toronto is the first city in Canada to implement a shade policy. To advance this policy, a film was produced to present the members of this group, describe its workings,
discuss the policy and demonstrate the necessity of multi-disciplinarity for skin cancer prevention. The Shade Policy Committee of the UVRWG secured funding to hire a documentary film maker. Together this group prepared a film script that would encapsulate the rationale for shade, the necessity of including a range of expertise in shade creation, present the views of shade promoters and present examples of shade in Toronto. The film was shot and produced in 2013, and released publicly on You-tube in 2014. Entitled “Partners in Action: A Shade Policy for the City of Toronto”, it won the 2014 Canadian Dermatology Association Public Education Award. Activity in Toronto for shade creation represents a successful synergy linking UVR awareness and skin cancer prevention with public health, city planning, urban forestry, civic design and health promotion policy. The use of social media extends the reach of health promoters to a larger audience and is an effective tool for skin cancer prevention. If accepted, we intend to screen the film during this time slot. Funding source: The City of Toronto / Toronto Public Health

Our learning objectives include:

1) Strategy to implement a shade policy.

2) Health and environment are inextricably linked.

3) Working effectively in an interdisciplinary group.

4) This shade policy is an example of successful synergy linking public health, city planning, urban forestry, civic design and children's services and health promotion.

Concurrent Session 1C - UV and Health
Communication Strategies

Economic Benefits of Australia’s SunSmart Program
- Sophy Shih2, Rob Carter1, Sue Heward1, Craig Sinclair1

Affiliations: 1Cancer Council Victoria, Melbourne, VIC, Australia, 2Deakin University, Melbourne, VIC, Australia

Introduction: The aim of this presentation is to provide an update on the economic evaluation of the Australian SunSmart program as well as outline the cost of skin cancer treatment to the Victorian public hospital system. This follows the publication of two recently released published economic evaluations that discusses the potential effects of skin cancer prevention inventions.

Methods: Program cost was compared to cost savings to determine the investment return of the program. In a separate study, a prevalence-based cost approach was undertaken in public hospitals in Victoria. Costs were estimated for inpatient admissions, using State service statistics, and outpatient services based on attendance at three hospitals in 2012-13. Cost-effectiveness for prevention was estimated from ‘observed vs expected’ analysis, together with program expenditure data.

Results: With additional $AUD 0.16 ($USD 0.12) per capita investment into skin cancer prevention across Australia from 2011 to 2030, an upgraded SunSmart Program would prevent 45,000 melanoma and 95,000 NMSC cases. Potential savings in future healthcare costs were estimated at $200 million, while productivity gains were significant. A future upgraded SunSmart Program was predicted to be cost-saving from the funder perspective, with an investment return of $3.20 for every additional dollar the Australian governments/funding bodies invested into the program. In relation to the costs to the Victorian public hospital system, total annual costs were $48 million to $56 million. Skin cancer treatment in public hospitals ($9.20~$10.39 per head/year) was 30-times current public funding in skin cancer prevention ($0.37 per head/year).

Conclusions: The study demonstrates the strong economic credentials of the SunSmart Program, with a strong economic rationale for increased investment. Increased funding for skin cancer prevention must be kept high on the public health agenda. This would also have the dual benefit of enabling hospitals to redirect resources to non-preventable conditions.

Learning Objectives:

1. To highlight the cost effectiveness of skin cancer prevention in Australia

2. To highlight the costs of skin cancer treatment in the Victorian public hospital system

3. To provide strong evidence to inform governments of the value of skin cancer prevention to reduce the costs of treatment in future years.

Information to consumers, are we in the know?
- Brigitta Boonen

Affiliations: Belgian Cancer Foundation and Euroskin, Brussels, Belgium

Introduction: Surveys reveal that the prevalence of sunbed use is high in Belgium compared to other European Countries despite the broad knowledge of the risks.
Behavioral insights show that the decision to artificially tan is influenced by many factors. Not many stakeholders support a total ban based on the argumentation of free choice and free will of the individual.

The presentation deals with the important issue: does an informed, free choice exist? Are we dealing with an individual or a societal problem?

Methods: We used data from many sources to answer these questions:

- Behavioral, philosophical, Social marketing and neuroscience insights
- Publications on tanning addiction
- Data from a 2 yearly tracking survey that monitors tanning and protection behavior and investigates the use and motives for sunbed use.
- Evaluation data from Belgian sunbed campaigns aimed at increasing awareness and behavior change.
- Monitoring of public opinions media, policy interventions

Results: A careful analysis of facts, figures and insights shows that a free informed choice might not exist and be even impossible to achieve:

- Insights from neuroscience strongly indicate that free will is an illusion
- Consumer are exposed to Marketing techniques of the industry, lacking risk information and are misled by the industry
- Behavioral insights show that tanning is an emotional choice, undergoing peer pressure and culturally defined
- Insights on heath communication show that risk perception is poor
- Tanning can be addictive
- Failing self-control and non-effective government control puts consumer in danger

Conclusions and Learning objectives: We are not in the know and even fully informed tanning is not a rational choice based on insights.

The liberal argumentation that the customer has a free informed choice and a ban would limit that choice is a false argument.

Learning Objectives:

- Many factors (addiction, context, peer pressure, industry marketing) are influencing our free choice to tan.
- Insights from many scientific disciplines show that free choice is an illusion
- Allowing tanning centers is a societal and not an individual choice and issue.

A hole in one – promoting sun protection in golf settings - Elizabeth King

Affiliations: Cancer Council NSW, Sydney, NSW, Australia

Introduction

Improve your long game (IYLG) is a skin cancer prevention program, targeting recreational golfers aged 40 years and over across New South Wales (NSW), Australia. Delivered by Cancer Council NSW (CCNSW) and co-funded with Cancer Institute NSW since 2015, IYLG aims to improve golfer’s sun protection behaviours by implementing a multifaceted approach within golf clubs. Men over 40 years are a key priority population for the NSW Skin Cancer Prevention Strategy, as they are 1.5 times as likely to be diagnosed with melanoma and around twice as likely to die from it than women of a similar age.

Key strategies include developing the clubs and golfers’ skills to improve sun protection, creating supportive environments, and normalising good sun protection practices through positive role modeling. While IYLG is currently running in 100 clubs, this research focused on new opportunities to develop a scalable and sustainable program to optimise program reach and effectiveness

Methods: Qualitative and quantitative research methodologies have been used to develop, refine and evaluate program messaging, and the feasibility and acceptibility of IYLG. Qualitative data collection via face to face interviews with key staff in six golf clubs, followed by in-depth telephone interviews with an additional 48 club staff representatives across NSW was conducted in 2017 to gain contextual insights regarding the acceptibility, feasibility, sustainability and scalability of the program.

Results: Skin cancer remains a key issue for golfers. Golf clubs recognise the need for sun protection and value a program tailored to their own setting focused on benefiting members. Satisfaction with IYLG was high among clubs with scalable opportunities identified.

Conclusions: Our iterative evaluation found that golf clubs are an acceptable setting for a targeted skin cancer prevention program. Strategies to build engagement and expand participation will ensure the sustainability of the program.
Learning Objectives:

• A targeted, tailored and relevant program that provides added value to the golf experience
• Benefits of a staged, scalable approach to gradual program roll-out
• Educating and upskilling program champions to increase the long-term sustainability of the program within the setting.

Help a Dane - How the world helped raise Danish awareness about sun protection - Thomas Koefoed, Dorte Dahl

Affiliations: The Danish Cancer Society, Copenhagen, Denmark

Introduction: Denmark has the fifth highest incidence of melanoma in the world, and studies show that Danes get a large fraction of their yearly UV-exposure on their sunny holidays. Therefore, the Danish Sun Safety Campaign aimed to raise awareness about sun protection abroad.

Methods: We created a campaign in two parts. For part 1, we made a film for each of the Danes' favourite travel destinations, and launched them on Facebook and YouTube. Thousands of locals in France, Greece, Italy, Spain and Thailand interacted with the campaign and the story was picked up by the international press. For part 2, we made a film for the Danes, where we highlighted the scope of the international involvement and mixed it with sun safety advice and stories about typical Danish holiday behaviour from the locals. The film, and loads of follow-up content, was launched during the summer of 2017.

Results: We surveyed 1,500 Danes age 15-25 who had been on a sunny vacation in the summer of 2017, and the results were very uplifting. 51% knew of the campaign ‘Help a Dane’ and 63% stated that the campaign had reminded them to use sun protection on their holiday. Furthermore, 42% stated that it had increased their knowledge about sun protection and another 42% had even talked to friends or relatives about the campaign.

Conclusions: Asking the world for help proved to be a very effective and heart-warming experience. Getting advice from locals instead of health professionals and scientists, gave the Danes a new perspective on their behaviour. Nobody wanted to stand out as the ‘sunburned Danish tourist’.

Learning Objectives:

• Introduction to the campaign background
• Insights into the cogs and levers of a complex international campaign in two parts
• Findings from the campaign evaluation

Does it All Add Up? Impact of a State-Wide Television Campaign About Incidental and Cumulative Exposure on Sun Protection Behaviours - Tamara Tabbakh1, Anna K. Nicholson1, Heather Walker2, Suzanne Dobbinson1

Affiliations: 1Centre for Behavioural Research in Cancer, Cancer Council Victoria, Melbourne, VIC, Australia, 2SunSmart Victoria, Cancer Council Victoria, Melbourne, VIC, Australia

Introduction: The ‘UV. It All Adds Up’ campaign highlights the dangers of cumulative and incidental UV damage and the importance of protecting your skin outdoors. The television advertisement (TVC) was first broadcast in the summers of 2015-16 and 2016-17 in Victoria, Australia. This study assessed the campaign’s impact on sun protection.

Methods: The National Sun Protection Survey is a weekly cross-sectional study of adults aged 18-69 years, recruited and surveyed by landline/mobile phone on Monday and Tuesday evenings in summer. Here we present weighted results for Victorian adults surveyed in 2013-14 (N=938) and 2016-17 NSPS (N=693). Outcomes were sunscreen use on summer weekends and spending an hour or more in the sun unprotected on the last sunny day (‘time unprotected’). Multivariate logistic regression was used to explore i) change over time between 2013-14 and 2016-17 and ii) the association between TVC awareness and behaviour in 2016-17. Analyses adjusted for age, gender, skin sensitivity and relevant weather-related factors (temperature and UVI).

Results: Overall, 37% of Victorian adults were aware of the TVC. Among those, the vast majority recalled a relevant message. The odds for sunscreen use were 46% higher in 2016-17 (45%) than in 2013-14 (37%) (AOR: 1.46, 95% CI: 1.05-2.03). However sunscreen use was similar among adults who recalled the TVC (49%) and those who did not (42%) (AOR: 1.55, 95% CI: 0.91-2.65). Time unprotected was similar in 2013-14 (19%) and in 2016-17 (17%) (AOR: 0.86, 95% CI: 0.66-1.11). The odds of time unprotected were more than halved (AOR: 0.42, 95% CI: 0.26-0.69) among
adults aware of the TVC (21%) compared to those who were not (10%).

Conclusions: The UV. It All Adds Up TVC effectively conveyed the harm of cumulative and incidental UV exposure and appears to have reduced time unprotected in the sun among adults who recalled it.

Learning Objectives:
• To consider the reach of a television led skin cancer prevention campaign (‘UV. It All Adds Up’) among young adults in Victoria (in the context of declining television viewing)
• To understand whether the ‘UV. It All Adds Up’ television advertisement can effectively convey messages about the harm of cumulative and incidental UV exposure
• To consider the impact of the ‘UV. It All Adds Up’ television advertisement on sunscreen use and time outdoors unprotected on summer weekends

Providing free sunscreen in Toronto parks
- Danielle Paterson

Affiliations: City of Toronto, David Cornfield Melanoma Fund, Douglas Wright Foundation

Introduction: Skin cancer is the most common cancer in Canada and the incidence of melanoma is increasing. The City of Toronto, the David Cornfield Melanoma Fund (DCMF) and the Douglas Wright Foundation (DWF) launched a skin cancer prevention pilot project featuring sunscreen dispensers in August 2017. The pilot was inspired and informed by the launch of sunscreen dispensers in US cities, and was approved by Health Canada. The purposes of the pilot were (1) to provide Torontonians with sunscreen in select city parks and (2) to raise awareness about the importance of sun protection to Canadians.

Methods: Six sunscreen dispensers were installed in five Toronto parks from August 2-October 4, 2017. Dispenser signs encouraged the use of sunscreen and directed users to visit besunsafe.ca for more information on the pilot project, skin cancer and sun safety. DCMF and DWF coordinated the implementation and covered all costs of the pilot. Maintenance crews provided by DCMF and DWF maintained the dispensers. The City of Toronto provided locations, coordination and communications support.

The pilot project was launched with a press release and social media posts. All communication materials and resulting media coverage emphasized the severity of skin cancer (with a particular focus on melanoma), the need for sun protection, and the importance of using sunscreen in conjunction with shade, clothing, hats, sunglasses and limiting sun exposure.

Results
• # of dispenser users: 2,500-5000
• press release reach: 4,115 news media outlets
• # of media articles: 22
• partner Facebook:
  - 10 posts
  - 52,245 reached
  - 6% engagement rate
• partner Twitter
  - 16
  - 51,787 reached
  - 1% engagement rate

Conclusions: The pilot project raised awareness of the importance of sun protection, provided sun protection to Toronto park users, and served as a test that will help inform future expansion.

Learning Objectives:
• Learn how to implement sunscreen dispensers in public parks as part of a broader skin cancer awareness campaign
• Learn about using a partnership model in health promotion
• Learn about using social media and media engagement to promote health

The National Council on Skin Cancer Prevention
- Creating a United Voice - Sophie Balk1, J Leonard Lichtenfeld2, Shelby Moneer3, John Antonishak4

Affiliations: 1Children’s Hospital at Montefiore, Bronx, NY, Bronx, NY, USA, 2American Cancer Society, Inc., Atlanta, GA, USA, 3Melanoma Research Foundation, Washington, DC, USA, 4National Council on Skin Cancer Prevention, Washington, DC, USA

Introduction: The (US) National Council on Skin Cancer Prevention (NCSCCP) is composed of more than 45 member organizations in the US and Canada whose missions
focus on or include skin cancer prevention. The vision of the NCSCP is to be a united voice to create a world without skin cancer; the mission is to prevent skin cancer through education of our members, advocacy and raising public awareness. NCSCP members represent the nation’s premier researchers, clinicians and advocates for skin cancer prevention. The NCSCP meets twice yearly to update members on key skin cancer prevention areas, plan projects, highlight achievements of member organizations through presentations and discussions, and provide networking opportunities. In this presentation, we will describe the NCSCP, review goals, and discuss major accomplishments over the last five years.

Methods: We will review the NCSCP history, structure, member organizations, position statements, meeting structure, major initiatives, members’ evaluations of meetings, and challenges to ongoing work.

Outcomes: The NCSCP continues to grow and evolve. We will describe two national initiatives: the “Don’t Fry Day” campaign (taking place on the Friday before Memorial Day in the US) aims to raise awareness of skin cancer prevention and encourages people to protect themselves as they start the summer season outdoors; and the Indoor Tan-Free “Skin Smart Campus” Initiative and Award, spurred by the US Surgeon General’s 2014 Call to Action to Prevent Skin Cancer. This initiative aims to support and celebrate colleges and universities that ban indoor tanning within their campus, and to provide educational resources to students about the dangers of ultraviolet radiation.

Relevance: The NCSCP can be a model for people in other nations seeking to impact the skin cancer epidemic. As reducing skin cancer is too large a task to take on alone, collaboration is key to successfully impacting this disease.

Learning Objectives:
1. Participants will learn about the US National Council on Skin Cancer Prevention’s mission and vision.
2. Participants will hear about 2 current National Council on Skin Cancer Prevention initiatives.
3. Participants will understand how the National Council on Skin Cancer Prevention can serve as a model for people in other nations seeking to impact the skin cancer epidemic.

Concurrent Session 2A - Starting Early: Sun Safety for Children and Schools

Sun Protection Practices in Head Start and Day Care Programs in Illinois 2017 - June K. Robinson, Megan M. Perez

Affiliations: Northwestern Univ Feinberg Schl of Medicine, Chicago, IL, USA

Introduction: Sun safety attitudes and habits developed in early childhood can reduce lifetime ultraviolet radiation exposure and the risk of skin cancer.

Methods: A survey of 202 administrators or managers and teachers from Illinois Head Start/Early Head Start (HS/EHS) and day care centers (DCC) was conducted from July 3-21, 2017. Organizations were randomly selected to assure proportional representation of urban, suburban, town, and rural locations of the Illinois population vulnerable to UV exposure. Program administrators participated in a 5-10 minute phone interview which assessed importance of health and sun protection behaviors, program practices, and demographic characteristics.

Results: The three most important health habits were good nutrition (66 [64.7%] 102 HS/EHS, 71[71.0%] day care), adequate exercise (41 [40.2%] HS/EHS, 55[55.0%] day care), and brushing teeth (35[34.3%] HS/EHS, 38 [38.0%] day care). Scheduling outdoor activities to avoid peak sun intensity was performed less by HS/EHS programs (46[45.1%] in comparison with day care programs (71 [71.0%), p<.001. Sunscreen was provided for students in 109 programs, but 84 (77.1%) did not allow children to apply sunscreen themselves. Half of these programs (100 of 202[50.0%] use spray sunscreen to avoid unnecessarily touching children. Most programs did not report any children having sunburns (129 [63.9%]) and followed heat index guidelines (114[56.4%]).

Conclusions: Administrators did not identify sun safety as one of the most important health habits. Spray sunscreen was often sprayed onto the child’s face with the eyes closed. Adopting UV index policies could prevent sunburns in early spring when the heat index in Illinois is low but the UV index is high enough to cause sunburns. Dermatologists may assume responsibility for educating administrators about the danger of spraying sunscreen directly into a child’s face and the advantage of using the UV index to determine when sun protection is needed.
Learning Objectives:

• Recognize the importance of sun protection with respect to other health habits for pre-school children.
• Understand the current use of spray sunscreen for pre-school children in Head Start/ Early Head Start and day care programs.
• Provide dermatologists with specific educational responsibilities for administrators of Head Start/ Early Head Start and day care programs.

Using the UV-index to reach parents of young children with sun protective messages: evaluation of an online campaign - Kim Kruijt

Affiliations: Dutch Cancer Society, Amsterdam, Netherlands

Introduction: Currently, marketing communication is shifting towards online advertisement. Additionally, exposure of subjects to a sun protective message might be more effective when the UV-index is high, i.e., scores from 6 on a scale of 1 to 8 (maximum in the Netherlands). In this study we evaluated an online campaign that exposed subjects to sun protective messages when the UV-index was high.

Methods: An online campaign was developed with ads on social media (e.g. Facebook, Instagram) and Google AdWords aimed to target parents with young children. Subjects were only exposed to the ads when the UV-index was 6 or higher. Subjects were exposed to short videos with sun protection messages and written ads with more in depth information. By clicking on the ads, subjects were sent to a website providing additional information about sun protection.

Results: With a budget of €10.000, 2.793.990 subjects (25% of the target group) were exposed to the social media campaign. 365.255 Video views were realized with a minimum view of 3 seconds for €0,03 per view, which is high for an awareness campaign. The canvas ads were opened 2.693 times, with an average viewing time of 15 seconds. The higher the UV-index, the less budget was needed to reach the same amount of views. The Google Adwords campaign reached about 25.000 people with a budget of €2.000. The Click Through Rate was 26.31%. For Google AdWords, we were nominated for the Dutch Search Awards.

Conclusions: This study showed that an online campaign aiming to protect children from a sunburn is a cost effective method to reach a specific target group. The impact of the ads might be higher, when the UV-index is high. It should be examined whether intentions of sun protective behaviour of parents actually changed after exposure to the online ads.

Learning Objectives:

• Online campaigns are a cost effective method and can easily reach and inform the specific target group with sun protective messages when it’s relevant.
• Online ads with a sun protective message might be more effective when the UV-index is high.
• It’s effective to combine several communication methods in a campaign: Media attention about a high UV-index contributes to the number of clicks on an online ad.

Costs of Sun Protection Policy Implementation in California School Districts - Richard T. Meenan1, David B. Buller2, Kim D. Reynolds1, Kim Massie3, Julia Berteletti2, Mary K. Buller1, Jeff Ashley4

Affiliations: 1Center for Health Research, Kaiser Permanente Northwest, Portland, OR, USA, 2Klein Buendel, Inc., Golden, CO, USA, 3School of Community & Global Health, Claremont Graduate University, Claremont, CA, USA, 4Sun Safety for Kids, Burbank, CA, USA

Introduction: Implementation of sun safety practices is an important element of efforts by elementary schools to prevent skin cancer among their students. However, cost can significantly impede such implementation.

Methods: The Sun Safe Schools (SSS) trial provided technical assistance to 118 California public elementary schools interested in implementing sun safety practices consistent with district policy. Intervention components were primarily an initial meeting with school administrators and follow-up email and telephone communications. Practices selected for implementation were combined into 47 generalizable sun safety practices within ten categories (e.g., outdoor shade, parent outreach). Using a micro-costing approach, costs of intervention delivery by the intervening organization were determined from the project tracking database supplemented by external sources. Labor and non-labor practice costs incurred by schools were estimated using a project template, which three authors reviewed for reasonableness.
Results: Average cost of participating in the school-based sun safety intervention was $348/school (median=$214, sd=$213, range=$68-$995). Average intervention delivery cost for the intervening organization was $111/school (median=$94, sd=$65, range=$28-$300) and for the schools, $223/school (median=$187, sd=$156, range=$0-$759). On average, approximately 64% of the intervening organization’s costs were in time managing email communications with the schools versus 39% of the school’s costs. The 58 intervention schools implemented a total of 128 practices (mean=2.2, median=1.0, sd=2.6, range=0-10). Thirty-seven schools implemented at least one practice (mean=3.5, median=3.0, sd=2.4). Average cost of implemented practices was $2,867/school (median=$1,250, sd=$5,329, range=$209-$26,400). Most common practices were parent outreach (34 schools) and education of students (32) and education of students (32) and education of students (32) and teachers (20).

Conclusions: Costs to schools may hinder action on implementation, so cost control strategies should be considered when designing school-based sun safety interventions. Next steps are to determine: (1) the incremental implementation cost of the SSS intervention and (2) the incremental cost of the schools’ sun safety education and policy adoption actions induced by SSS.

Learning Objectives:
1. Describe costs of implementing sun safety practices in elementary schools.
2. Describe process of organizing intervention workflow into activity categories that facilitate cost analysis.
3. Describe next steps of analysis to follow from the results reported in the abstract.

Determinants of Supportive Sun Protection Behavior of Parents and the Relationship with Sun Protective Behaviour of the Child.

Karlijn Thoonen1, Francine Schneider1, Kim Kruijt2, Bart de Wolf2, Hein D. Vries1, Liesbeth V. Osch1

Affiliations: 1Maastricht University, Maastricht, Netherlands, 2Dutch Cancer Society, Amsterdam, Netherlands

Introduction: Unprotected sun exposure during childhood is more strongly associated with melanoma than exposure during adulthood. While parents play an important role in sun protection of their child, a shift in the behavioural responsibility from parents towards children is thought to take place during early adolescence. When and how the shift from parental executive behavior (i.e. actual performance of sun protective actions) to supportive behaviour takes place, is however unclear.

Methods: A longitudinal study with four measurements (from 2016 – 2019) was conducted among Dutch parents (n=1053) of children aged 4 to 12 years. Online questionnaires were used to measure parental executive and supportive behavior, executive behavior of the child and various socio-cognitive determinants of these behaviors, based on the behavioral I-Change model. Linear regressions were performed to predict supportive behavior of the parent and executive behavior of the child.

Results: Children’s sun protective executive behaviours tend to increase, with the strongest increase between 5 to 6, and 9 to 10 years. Within the course of the parental supportive role, no significant age pattern was shown. Significant predictors of children’s executive behavior were the age of the child, self-efficacy, attitude and action plans, whereas supportive behavior of the parent was determined by their intention, social norm, attitude and action plans.

Discussion: Children’s age proved to be the most important predictor for children’s executive sun protective behavior, whereas age of the child did not play a significant role in the prediction of supportive behavior of the parent. Future prevention programs for children should be targeted towards specific age groups, with an emphasize on parental executive behavior in early ages and supportive behavior of parents and children’s executive behaviour in later ages.

Learning Objectives:
1. To gain insight in underlying determinants of changing health (sun protective) behavior
2. To be able to examine the role children’s age plays in sun protective measures from both the child itself as the parent
3. To be able to gain more specific knowledge about which age groups of children should be targeted in future sunburn prevention programs and what aspects of behavioral change of their parents should be taken into account
4. To be able to gain further insight in possible behavioral approaches that take children’s age and other important determinants into account and can be used in future sunburn prevention programs
Border Students are Sun Safe: Skin Cancer Prevention Education for Hispanic Adolescents Attending Rural, Border High Schools - Lois J. Loescher¹, Gail Emrick²

Affiliations: ¹The University of Arizona, Tucson, AZ, USA, ²Southeast Arizona Area Health Education Center, Nogales, AZ, USA

Background: Few skin cancer prevention programs target rural, underserved, Hispanic adolescents. Project Students are Sun Safe (SASS) has been implemented successfully in urban middle and high schools. The current model is limited in that university students trained as peer educators cannot travel long distances to rural schools to present SASS. Using a CBPR framework, university and community partners adapted SASS for dissemination to underserved rural high schools adjacent to the U.S.-Mexico border.

Purpose: To determine the feasibility of implementing Border SASS in classrooms and evaluate the main outcomes of skin cancer knowledge, beliefs, and risk-reducing behaviors in students.

Methods: The partnership team adapted the SASS classroom lesson, considering cultural appropriateness and class period length. Trained high school peer educators (n = 18) delivered the adapted Border SASS lesson to 220 classroom students in 3 high schools over 4 months. The pretest assessed demographics and risk factors along with main outcomes. Students completed an immediate posttest and posttest 2 four months later.

Results: Evaluable participants were students who completed all 3 tests (n = 198; 90% response rate). Main outcomes increased significantly from pretest to posttests 1 and 2. The overall correct score on knowledge items increased from 40.61% (SD, 20.8) to 53.33% (SD, 22.62) (p = <001). Number of sun protective behaviors increased from mean = 2.45 (SD, 1.33) behaviors to mean = 3.58 (SD, 1.33) behaviors (p = <.001). On pretest 124 (62.6%) participants thought it was definitely important to examine their own skin, increasing to 179 (90.4%) on posttest 2 (p = <.001). Students were highly satisfied with Border SASS.

Conclusions: Border SASS was successfully implemented in underserved Hispanic adolescents. Participants sustained skin cancer risk-reducing behavior for 4 months. Knowledge improved but remained low, suggesting the need for potential boosters and continued dissemination in rural high schools.

Learning Objectives: At the end of this presentation, participants will be able to:

1. Summarize at least 2 known facts about the problem of skin cancer in U.S. Hispanics.
2. Describe at least 2 strategies for implementing skin cancer prevention education in rural schools.
3. Identify at least 2 challenges of conducting CBPR in rural schools.

Solsmart Game – A New App Teaching Kids About Sun Safety - Solveig Høgh Larsen, Christina S. Krüger-Jensen

Affiliations: Kræftens Bekæmpelse, København Ø, Denmark

Introduction: Sunburn during childhood is a risk factor for malignant melanoma. In 2017, The Danish Sun Safety Campaign launched the game ‘Solsmart’ or ‘Sunsmart’ to teach children about healthy habits in the sun. The game is available in Appstore and Google play and Android for tablet and smartphone to make learning about sun safety reachable, relevant and fun for youngsters.

Methods: ‘Solsmart’ was developed from existing educational material for children in primary school. Contrary to the existing material, the game aimed for use outside school setting eg. on vacations. While playing the game, children aged 5-10 years get to practice the three sun safety advices; shade, sunhat and sunscreen, by fighting the ultraviolet radiation like a ninja and jumping from shade to shade etc.

‘Solsmart’ was mainly promoted through influencers. The Danish Sun Safety Campaign challenged a 7-year-old Youtuber with 137.000 subscribers and a 23-year-old gamer to play ‘Solsmart’ and make a Youtube video about the game afterwards. Furthermore, we collaborated with four Danish mommy bloggers. The bloggers tested and then wrote blog about the game.

Results: ‘Solsmart’ was received very positively by both children and their parents. The engagement rate was high. Data from Google analytics and iTunes shows that 19.000 people created a game-user. ‘Solsmart’ was played more than 73.000 times and the Youtube videos got over 200.000 organic views and 400 comments.

Conclusions: Using gaming as a method to teach children about sun safety turned out to be very successful. Parents could easily download the app, and use it as a tool for
Talking about sun safety with their children. The use of popular influencers to promote the game was very effective - because the target group can relate to the young influencers.

Learning Objectives: This presentation will cover:

- How to create a game/app about sun safety for children
- How to use influencers to promote a gaming app
- How gamification can be used as an effective UV prevention strategy.

Concurrent Session 2B - Advancing Methods and Tools in Skin Cancer Prevention Research

Development and Validation of a Risk Prediction Tool for Melanoma in a Prospective Skin Cancer Cohort of 41,954 Participants - David C. Whiteman, Catherine M. Olsen, Nirmala Pandeya, Bridie S. Thompson, Jean Claude Dusingize, Penny Webb, Adele C. Green, Rachel E. Neale, The QSkin Study

Affiliations: QIMR Berghofer Medical Research Institute, Brisbane, QLD, Australia

Introduction: Risk stratification can improve the efficacy and cost-efficiency of screening programs for early detection of cancer. We sought to derive a tool for predicting future risk of melanoma to enable accurate triaging of disease-free patients to appropriate levels of surveillance. Importantly, the tool uses information that can be self-reported by patients in the clinic or in other settings.

Methods: We used melanoma risk factor information collected at baseline from QSKIN, a prospective cohort study of Queensland adults aged 40-69 at recruitment (n=41,954). We examined two separate outcomes: 1) invasive melanomas; and 2) all melanomas (invasive + in situ) ascertained through data-linkage to the cancer registry. We used stepwise Cox proportional hazards modelling to derive the risk models in a randomly selected two-thirds sample of the dataset and assessed model performance in the remaining one-third validation sample.

Results: After median follow-up of 3.4 years, 655 (1.6%) participants developed melanoma (257 invasive, 398 in situ). The prediction model for invasive melanoma included eight terms. The strongest predictors of invasive melanoma were age, sex, tanning ability, and number of moles at age 21. The model for all melanomas (i.e. invasive and in situ) included four additional terms. Discrimination in the validation dataset was high for both models (C-index 0.69 and 0.72 respectively) and calibration was acceptable.

Conclusion: A simple tool using self-reported information on eight items predicts melanoma risk with high discrimination. A targeted screening program based on model-derived cut points, in which 40% of the population were screened, would detect 75% of invasive melanomas occurring in this population.

Learning Objectives:

1. to illustrate how risk prediction tools are derived and validated using cohort data
2. to demonstrate the performance of a risk prediction tool for melanoma
3. to explore how such a tool might be implemented in practice, including consideration of sensitivity and specificity

Seeing UV in Multiple Colours - Zim Sherman

Affiliations: Scienterra Ltd., Oamaru, New Zealand

What is UV, and how do we measure personal exposure? How can we measure it better?

Although sunburn has been around since the cavemen, we only became aware of UV radiation in 1801. It took until the 1960s for us to learn of its ability to damage DNA. We are still learning about its role in human health.

UV is part of the electromagnetic spectrum, and just like colours in the visible spectrum, it comes in many shades and hues. Each UV “colour” has different characteristics, and each has different effects on human physiology: UVA accelerates aging of the skin; UVB causes erythema, and is required for synthesis of vitamin D; UVC is not present in the natural environment, but can be quite dangerous in industrial settings.

Electronic sensors are now manufactured to sense specific parts of the UV spectrum. Electronic dosimeters have typically measured a single colour of UV. By modifying these dosimeters to use multiple sensors, we can see in multiple colours. This additional information creates a much richer story.
We will show examples that demonstrate how multi-colour electronic dosimetry reveals a more complete picture of personal UV exposure and its effects on human health. We will also share some practical advice about how to set up a successful dosimetry experiment.

Learning Objectives:
- Brief history of UV radiation
- The characteristics of UVA, UVB, and visible radiation
- What can be learned from multi-colour UV dosimetry
- Practical advice for setting up a dosimetry experiment

Decision Tree Model of Sun Protection - Kasey L. Morris, Frank M. Perna

Affiliations: National Cancer Institute, Bethesda, MD, USA

Introduction: Understanding patterns of sun protective behaviors and their association with sunburn can provide important insight into measurement approaches and intervention targets. The aim of this research was to assess whether decision-based modeling can be used to identify patterns of sun protective behaviors that predict likelihood of sunburn, and compare the predictive value of this method to traditional (i.e., composite score) measurement approaches.

Methods: Data was obtained from 31,162 non-institutionalized civilian US adults in the 2015 National Health Interview Survey. Association between multiple sun protective behaviors (i.e., sunscreen use, shade seeking, hat wearing, and protective clothing) and sunburn were examined using a decision tree analysis.

Results: Twelve unique patterns of sun protection were identified. The group with highest likelihood of sunburn were those who used only sunscreen (50.4% sunburned). The group with the lowest likelihood of sunburn were those that did not report using sunscreen, but did engage in the other three protective behaviors (12.1% sunburned). The decision tree model and the typical composite score approach correctly classified a similar number of cases. However, the decision tree was superior to the composite score in classifying cases with sunburn (20.4% vs. 0% correctly classified).

Conclusions: This study used a novel analytic approach to demonstrate the unique, interactive, and sometimes counterintuitive effects of multiple sun protective behaviors on likelihood of sunburn. These data show where traditional measurement approaches of behavior may fall short, and highlight the importance of linking behavior to a clinically relevant outcome. Given the scope of those affected, and enormous associated healthcare costs, improving efforts in skin cancer prevention has the potential for significant public health impact.

Learning Objectives:
- Attendees will be able to describe associations between sun protective behaviors and sunburn.
- Attendees will be able to describe the difference between traditional measurement approaches and decision-based analyses in predicting incidence of sunburn.
- Attendees will be able to offer potential ideas for targeted intervention efforts.

The Daily Minutes of Unprotected Sun Exposure (MUSE) Inventory: Measure Description and Validation - Tammy K. Stump¹, Lisa G. Aspinwall², Shuai Xu¹, Nenita Maganti¹, June K. Robinson¹

Affiliations: ¹Northwestern University, Chicago, IL, USA, ²University of Utah, Salt Lake City, UT, USA

Introduction: Skin cancer rates continue to increase, indicating a need for high-quality research and interventions on sun protection. To improve measurement in this area, we developed the daily Minutes of Unprotected Sun Exposure (MUSE) Inventory, which yields a range of useful metrics, including time outdoors and percentage of outdoor time particular sun-protection strategies were used. Uniquely, the MUSE Inventory calculates duration of unprotected sun exposure on specific body sites and a composite score indicating duration of sun exposure after adjusting for percent of body exposed.

Methods: Participants in this validation study were 39 melanoma survivors (Mage=58.59, SD=12.76, 64.5% female). For 10 days, participants were asked to complete the daily MUSE Inventory each evening and wear a UV sensor; they completed the Sun Habits Survey following the 10-day study.

Results: Outdoor time reported in the MUSE Inventory significantly predicted outdoor time recorded by the UV sensor, B=.51, p<.001. For sun-protection strategies, MUSE percentages were significantly correlated with corresponding items from the Sun Habits Survey (rs=.39-
.86, p<.05), except for shade use (r=.12, p>.05). For this sample, the average overall MUSE score was 17.60 (SD=27.22), which is equivalent to being outside for about an hour (61.64 mins) while wearing no sunscreen, no hat, a T-shirt, long pants, and shoes (thus, exposing 28% of the body).

Conclusion: In sum, the Daily MUSE Inventory corresponds well with sensor and survey data, but differs from these measures by allowing for the calculation of an overall sun exposure composite score, accounting for multiple, potentially overlapping sun protection methods. Use of this composite score will improve research by enabling meaningful comparisons of sun exposure between subjects and over time, regardless of the specific methods of sun protection used.

Learning Objectives:
• Describe the MUSE Inventory, a new measure of sun exposure.
• Explain the methods used to validate the MUSE Inventory.
• Explain the MUSE composite score and how the authors propose it will benefit research.

If You Seek It: The Sunsmart App Establishes Sun Protection Habits Among Motivated Users - Anna K. Nicholson¹, Michael Murphy², Heather Walker², Laura Wakely¹, Anthony Ainsworth³, Rick Tinker³

Affiliations: ¹Cancer Council Victoria, Melbourne, VIC, Australia, ²MMResearch, Melbourne, VIC, Australia, ³Australian Radiation Protection and Nuclear Safety Agency, Yallambie, VIC, Australia

Introduction: SunSmart Victoria's SunSmart app provides information about the ultraviolet (UV) level and sun protection times, in order to assist with decisions about sun protection. Launched in 2010, the SunSmart app has been downloaded over 250,000 times. This paper contrasts understanding and use of UV information presented in the app among new and established app users.

Methods: Fifteen participants who use the SunSmart app were recruited via the app and interviewed in November 2016. In addition, adults aged 20-39 years with skin susceptible to burning were recruited by a market research agency to road-test the SunSmart app and participate in a focus group discussion. The semi-structured interview and focus group guides included questions on knowledge about UV, interpretation of information presented in the app and the application of this information to decisions about sun protection. Each discussion was recorded and transcribed. Data were analysed thematically.

Results: Many participants commented on new learning acquired through use of the SunSmart app, particularly about the duration of the day that sun protection is recommended during spring in Victoria. For existing users, the app, and in particular the daily alert, helped to build and maintain sun protection habits. For new users, the influence of the app varied. Some new users were prompted to change their behaviour, such as to apply sunscreen earlier in the day. Others had only been prompted to think about sun protection. For many new users, the sun protection times were perceived to be overly cautious, as these times were inconsistent with their personal experience of sunburn. Sunburn but not cumulative UV damage was associated with skin damage and skin cancer.

Conclusions: The SunSmart app provides new learning about UV and supports the development and maintenance of sun protection habits and routines among people who have sought it out.

Learning Objectives:
• To gain an understanding of whether smartphone apps can contribute to skin cancer prevention at a population level
• To increase awareness of the barriers to using UV information to inform sun protection behaviour in the Australian context
• To learn what features of smartphone apps are perceived to be most useful to developing and/or sustaining sun protection habits and routines.

seeUV: Using Augmented Reality to Create an Engaging Tool for Today's Sunsmart Generation - Laura Wakely¹, Heather Walker², Fernando Escorcia¹, Anna K. Nicholson¹, Rajesh Vasa², Kon Mouzakis²

Affiliations: ¹Cancer Council Victoria, Melbourne, VIC, Australia, ²Deakin University, Burwood, VIC, Australia

Introduction: The SunSmart program has had a powerful effect on Australian melanoma rates since the 1980s. Melanoma rates are decreasing among Victorians aged...
To build on this success, SunSmart Victoria sought innovative ways to engage younger audiences as part of its summer campaign. For this project, SunSmart Victoria investigated whether augmented reality could be used to tackle two key barriers to skin cancer prevention among young people:

- A lack of understanding that the UV index is the best indicator of sunburn risk.
- A disregard for the future consequences of UV damage at the individual level.

Methods: SunSmart Victoria engaged Deakin University’s Software and Technology Innovation Lab in a research partnership to explore how augmented reality could be used to educate young people about UV radiation and make the long-term, intangible risks of UV damage more immediate.

Results: Research and development for the seeUV app focused on two functions. The first is a ‘UV visualiser’ that uses geo-located UV and weather data to visualise UV radiation in the user’s environment and display a relevant message about the need for sun protection. The second is a skin damage selfie that places a filter of UV damage over a person’s face to portray the long-term consequences of not using sun protection. A number of challenges were encountered; the seeUV app is not able to identify indoor and reflective environments in order to portray their interaction with UV radiation. Further, the face mask required refinement for different skin tones, lighting conditions and for the intensity of damage shown. seeUV launched in Australia in November 2017. User engagement data will be available for presentation at the Conference.

Conclusions: Augmented reality has the potential to engage younger audiences in messages UV radiation and sun protection.

Learning Objectives:
- To increase awareness of the barriers to skin cancer prevention among young people in Victoria
- To understand what augmented reality is and how it can be used to visualise UV radiation and skin damage
- To understand the limitations of augmented reality to visualise UV radiation in the environment
- To understand whether augmented reality can reach and engage young audiences

Introduction: Sun exposure without adequate protection can be harmful to melanoma survivors. An accurate understanding of personal daily sun exposure levels is important. In the present study, we investigated accuracy of perceptions of sun exposure by comparing time outdoors reported in a self-report to an objective technology-based measure, using a shoulder-worn UV sensor (that captures UV dose in six-minute increments).

Method: Data was collected on 39 participants performing self-report measures of UV exposure while wearing the UV dosimeter (Shade®, V1.00, YouV Labs Inc., New York, NY) for 10 consecutive summer days. The alignment in sun exposure time was compared for the two measures. We report the Jaccard similarity coefficient (a statistic that compares the similarity and diversity of the data with 1 having perfect similarity between measures), true positive/negative, and false positive/negative rates on a minute and day level.

Results: Thirty-six participants (3 were removed for poor self-report) had a total of 283 days (77 days were removed due to participant noncompliance, minor technical issues (e.g., dead battery) or lack of sensor wear). Assuming the objective sensor is ground truth, results showed a mean Jaccard coefficient of 0.24 ± 0.11 (min=0.02, max=0.58). The average false positives in minutes was 39.46 ± 44.43 (min=1.33, max=242.62), while the average false negatives were 78.33 ± 42.87 (min=12.5, max=211.7). Twelve participants over-reported (greater false positives than false negatives) their time outdoors, while 24 participants were considered under-reporters (more false negatives than false positives). They under-report on average 14.4 ± 64.6 minutes per day (min=162 minutes, max=214 minutes) of sun exposure.

Conclusions: Our results show that participants often under-report their time spent outdoors. Obtaining an objective measure using a wearable UV dosimeter may prove to be more reliable than self-report in determining the UV dose and time spent outdoors in the sun.
Learning Objectives:

- Explain the benefits of using objective wearable measures of sun exposure compared to self-report measures.
- Describe how to calculate accuracy of self-report measures compared to a UV dosimeter (e.g. false alarm rate, false negative rate, precision, and recall)
- Explore the characteristics of melanoma survivors that over-report and under-report their sun exposure.

Concurrent Session 2C - UVFX: Skin Cancer and Other Outcomes

The Inverse Relationship Between the Incidence of Solar Induced Eye Disease and Reported Skin Cancer Rates at High Elevation in the Tropical Andes, Ecuador, South America - Nathan J. Downs1, 2, Daniel R. Garzon-Chavez3, 1, 2, Emmanuelle Quentin4, Simone L. Harrison1, 2, Alfio V. Parisi2, 1, Harry J. Butler2

Affiliations: 1College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, QLD, Australia, 2Faculty of Health, Engineering and Sciences, University of Southern Queensland, Toowoomba, QLD, Australia, 3School of Medicine, Universidad San Francisco de Quito, Quito, Ecuador, 4EpiSIG Instituto Nacional de Investigacion en Salud Publica, Quito, Ecuador

Introduction: The populated regions of the high tropical Andes experience near zenith daily solar elevations year-round and are often located several thousand metres above sea level. Consequently, the tropical Andes are a global hot spot for potential solar induced diseases. The 2010 National Institute of Statistics and Census (INEC, Ecuador) reported high skin cancer rates in elevated topical parishes situated in the Andes mountains, confirming the potential risk for residents in the world’s most extreme ultraviolet climate.

Methods: Annual surface ultraviolet exposure was determined for each parish on a 0.170 x 0.170 grid from remotely sensed satellite parameters including Surface reflectivity, Ozone, Aerosol and Cloud fraction. Data from the INEC calculated from hospital registers was examined for 1040 parishes of Ecuador across a total population of more than 16 million residents to establish localized incidence of both Pterygium and Senile Cataract by average annual surface ultraviolet exposure.

Results: An association with both Pterygium and Senile cataract was established with increasing annual average solar ultraviolet irradiance. Maximum incidence rates reached between 16.17 and 34.39 cases per 100 000 for Senile Cataract and Pterygium respectively. These rates were established for lowland coastal sites and contrast markedly with respective Senile Cataract and Pterygium incidence rates of 2.90 and 6.89 per 100 000 for residents living in high Andean mountain parishes. These trends are the opposite of what has previously been reported for skin cancer in Ecuador from the same INEC data set.

Conclusion: High elevation and increased peak intermittent solar ultraviolet may provide an explanation for high skin cancer rates in the mountains. However, long-term cumulative exposures obtained largely by surface reflections under brighter skies in lowland environments are likely to be responsible for greater instances of solar induced eye disease.

Sun Exposure Guidelines and Serum Vitamin D Status in Denmark: The StatusD Study - Brian Køster, The StatusD Project Group

Affiliations: The Danish Sun Safety Campaign, Danish Cancer Society, Copenhagen, Denmark

Introduction: Little is known on how vitamin D status is affected by adherence to UVB-limiting sun exposure guidelines. Our aim was to investigate the relationship between adherence to the Danish sun exposure guidelines and vitamin D status.

Methods: In total, 3194 Danes (2625 adults, 569 children) were recruited among the general population, and more than 92% had blood samples taken both autumn and
spring. Using linear regression, we associated serum vitamin D concentrations to questionnaire responses on: seeking shade, wearing a sunhat, wearing protective clothing or using sunscreen. The odds ratio (OR) of either low (<25 or 50 nmol/L) or adequate/high (>50 nmol/L) vitamin D status was examined using logistic regression.

Results: For adults, those who always sought shade or wore protective clothing compared to those who did not had lower levels of vitamin D (autumn concentrations for shade: 7.2 nmol/L lower (11.0–3.6 nmol/L); for protective clothing: 9.9 nmol/L lower (13.6–6.2 nmol/L). Adherence to all four guidelines was also associated with lower vitamin D concentrations (autumn: 9.7 nmol/L lower (14.3–5.1 nmol/L). Use of sunscreen was associated with adequate vitamin D status, as those who always sought shade compared to those who did not had an OR (95% CI) of 1.68 (1.25–2.35) of having >50 nmol/L during both spring and autumn. No associations were found with wearing a sunhat, and there were no clear associations for children.

Conclusion: Adherence to the sun exposure guidelines on shade and protective clothing was associated with lower vitamin D status among Danish adults, but not children.

Learning Objectives: We show:

• Vitamin D insufficiency distribution in the Danish Population
• Vitamin D associations to sun protection behavior

Associations of Statins and Diabetes with Diagnosis of Ulcerated Cutaneous Melanoma - Lena A. von Schuckmann1, David Smith1, Maria Celia B. Hughes1, Maryrose Malt1, Jolieke C. van der Pols2, Kiarash Khosrotehrani3, B. M. Smithers5, Adele C. Green1,6

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Ulcerated primary melanomas are associated with an inflammatory tumor micro-environment. We hypothesised that systemic pro-inflammatory states and anti-inflammatory medications are also associated with a diagnosis of ulcerated melanoma. In a cross-sectional study of 787 patients with newly-diagnosed clinical stage IIB or II melanoma, we estimated odds ratios (ORs) for the association of pro-inflammatory factors (high body mass index (BMI), diabetes, cardiovascular disease, hypertension and smoking) or use of anti-inflammatory medications (statins, aspirin, corticosteroids and non-steroidal anti-inflammatory drugs), with ulcerated primary melanoma using regression models and subgroup analyses to control for melanoma thickness and mitotic rate. Based on information from 194 patients with ulcerated and 593 patients with non-ulcerated primary melanomas, regular statin users had lower likelihood of a diagnosis of ulcerated primary melanoma (OR 0.67, 95% CI 0.45-0.99) and this association remained after adjusting for age, sex, thickness and mitosis. When analysis was limited to melanomas that were ≤2mm thick and had ≤2 mitoses/mm2 (40 ulcerated; 289 without ulceration), patients with diabetes had significantly raised odds of diagnosis of ulcerated melanoma (OR 2.90, 95% CI 1.07-7.90), adjusted for age, sex, BMI and statin use. These findings support our hypotheses that statin use is inversely associated, and diabetes is positively associated, with ulcerated melanoma.

Learning Objectives:

• Amongst patients with high-risk primary melanoma, regular statin users have reduced likelihood of a diagnosis of ulcerated melanoma
• Amongst patients with melanomas of relatively low proliferation, diabetics also have a higher probability of an ulcerated versus non-ulcerated melanoma

The Naked Truth About the Sun - How to Make Sun Protection Entertaining - Thomas Koefoed, Christine L. Behrens

Affiliations: The Danish Cancer Society, Copenhagen, Denmark

Introduction: More 15-19-year-old Danes are sunburned compared to the population average and melanoma is the most common cancer in 15-34-year-olds. Melanoma is avoidable applying sensible behaviour in the sun, but the youth are not easily reached by old media and health authorities.
Methods: The Danish Sun Safety Campaign created a mini-series with two popular Danish journalists/comedians. They were given a mission: Educate the Danes to expose less skin in the sun. Our heroes decided to take on the hardest possible target group for their mission: Nudists. The result was a mockumentary in 6 episodes – totalling 49 minutes of both educational and hilarious entertainment. The series was launched on social media and advertised in digital ads. The two hosts used their own profiles to create awareness about the campaign among their many fans.

Results: The series was hosted on a dedicated homepage which received 242,077 visits and the average user spent 11 minutes and 44 seconds on the page – streaming videos and reading content. This level of deep involvement was mirrored by the exceptionally high 84% view-through rate. Moreover, our campaign evaluation revealed that 67% of the 15-25-year-olds knew the campaign ‘Less skin in the sun’. Of those who knew the campaign 44% agreed that the campaign had increased their knowledge of sun protection and another 24% even stated an intention to be more careful in the sun in the future.

Conclusions: The campaign proved that, with the help of the right influencers, it is possible to catch the attention of an otherwise hard-to-reach audience. Furthermore, the deep level of involvement in the campaign showed that it is possible to make your target group spend a lot of time with your message if they find it relevant and entertaining.

Learning Objectives:

• Introduction to the campaign background
• Experiences with using influencers in health campaigns
• Insights into the creative solution and the media plan
• Findings from the campaign evaluation

Introduction: Although the number of naevi is the strongest predictor of melanoma risk, few studies have studied the life cycle of naevi in the general adult population. This study will use the Canfield VECTRA state-of-the-art technology to follow pigmented lesions over time using total body 3-D photography.

Methods: This study is a three-year prospective longitudinal population-based cohort study of the natural history of naevi in adults living in South-East Queensland, Australia. Using the VECTRA whole body scanner, total body 3-D photography was conducted to record and analyse all pigmented lesions (excluding scalp, beneath underwear and soles). All lesions 5mm or larger were dermoscopically recorded using the VECTRA system. Participants underwent a clinical skin examination and completed a questionnaire on their sun behaviour and health. These procedures will be repeated every six months for three years to identify changes in lesions. Participants also provided a saliva sample at the baseline visit.

Results: 152 participants were recruited via the Australian Electoral Roll. Participants had a mean age of 52 years and 109 (53%) were male. At baseline, 13 (9%) participants self-reported that they had previously been diagnosed with melanoma. At baseline, the mean number of lesions 5mm or greater was 11 for males (range 0-90) and 9 (range 0-47) for females. The average number of lesions greater than 5mm according to age group were 5, 6, 17, 10 and 9 for age groups 20-29, 30-39, 40-49, 50-59 and 60-69 years, respectively. The most common body site was the back, followed by the front of trunk for all age groups.

Conclusion: Males and the 40 to 49 year old age group had the greatest number of lesions 5mm and larger at baseline. Follow-up total body 3-D imaging will determine how these lesions will change in number, size and characteristics over time.

Learning Objectives:

• 9% of participants self-reported they had previously been diagnosed with melanoma
• The 40 to 49 year age group had the greatest average number of lesions at baseline
• The back was the most common body site for pigmented skin lesions 5mm and above
Increase in Primary Prevention Behaviour in Organ Transplant Recipients After Sun Protection Education in a Skin Cancer Surveillance Clinic - Louisa Gordon¹, Keren Papier¹, Kiarash Khosrotehrani², Scott Campbell³, Nikky Isbel³, Anthony Griffin³, Adele C. Green¹

Affiliations: Louisa Gordon¹, Keren Papier¹, Kiarash Khosrotehrani², Scott Campbell³, Nikky Isbel³, Anthony Griffin³, Adele C. Green¹

Introduction: Immunosuppressed organ transplant recipients (OTRs) are at greatly increased risk of multiple skin cancers compared with the general population. Since sun exposure compounds this risk, OTRs should be offered advice about sun protection as well as regular skin surveillance. When a new skin clinic dedicated to high-risk transplant recipients was established in Brisbane to expedite skin cancer treatment, we provided additional preventive education and then monitored OTRs’ short-term uptake of primary prevention behaviours.

Methods: Through the Princess Alexandra Hospital’s newly-established Transplant Skin Clinic, we recruited 101 consecutive transplant recipients (kidney (79), liver (22); 77% male; average age 63 years; average age at transplant, 48 years; 71% educated to high school level only). OTRs completed a survey at baseline and 3 months later (both during summer), reporting frequencies of weekday and weekend sun exposure and of using sunscreen, hat, long sleeves, sunglasses, shade. All OTRs were provided with printed material on sun protection, and received verbal prevention advice when possible.

Results: Preliminary analyses show that at baseline, 15% and 9% of OTRs attending the clinic spent 5-8 hours per day outdoors on weekdays and weekends respectively. At baseline 29% reported always using sunscreen when in the sun longer than 15 mins, 64% always wore a hat, 30% always wore long sleeves, 46% wore sunglasses and 31% stayed in shade whenever outside in the sun. On follow-up 3 months later, corresponding proportions were 19% and 18% weekday and weekend prolonged time outdoors; 49% always using sunscreen; 84%, hat; 61%, long sleeves; 60%, sunglasses and 71%, always staying in shade.

Conclusions: Within 3 months of attending a skin cancer clinic with supplementary prevention education, high-risk OTRs dramatically increased their everyday use of key sun protection measures compared with baseline, suggesting that primary prevention education is highly effective in these vulnerable patients.

Learning Objectives:
- To assess primary prevention activities of organ transplant recipients as a high-risk subgroup of the population
- To investigate the feasibility of supplementing clinical skin cancer surveillance of high-risk organ transplant recipients with targeted education about primary prevention
- To assess short-term change in primary prevention behaviours in organ transplant recipients after receiving targeted sun protection advice in a skin cancer surveillance clinic setting

Consumer Acceptance and Expectations of a Mobile Health Application to Photograph Skin Lesions for Early Detection of Skin Cancer - Monika Janda¹, Nicole Gillespie¹, Caitlin Horsham², Lois Loescher³, Thi-My-Uyen Nguyen², H. Peter Soyer¹, Dimitrios Vagenas²

Affiliations: ¹The University of Queensland, Brisbane, QLD, Australia, ²Queensland University of Technology - Institute of Health and Biomedical Innovation, Brisbane, QLD, Australia, ³The University of Arizona, Tuscon, AZ, USA

Background: Most melanomas are first noticed by the patient and hence regular skin self-examinations are important for the prevention and early diagnosis of skin cancers. Mobile health applications for the early detection of skin cancers may help facilitate skin self-examinations. This study assesses consumer acceptability and expectations of a mobile health application used to monitor and receive remote diagnosis of skin lesions for the early detection of skin cancer.

Methods: People over the age of 18 years who lived in Australia were invited to participate in an online survey about their mobile teledermoscopy acceptance. The online survey asked participants about skin self-examinations, views on mobile health applications and privacy issues surrounding the use of the mobile health application. The online survey responses were themed and coded by two researchers.

Results: The online survey was completed by 88 participants. The participants had a mean age of 38 years and 17 (19%) were male. Regular skin self-examinations were conducted by 56 (64%) of the participants. The main reasons for not conducting skin self-examinations
were forgetfulness (44%), perceived low risk of skin cancer (25%) and a lack of confidence in conducting skin self-examinations (25%). Most participants (95%) were accepting of mobile teledermoscopy and would consider sending photos of their skin lesions to a medical practitioner via the mobile health application. Participants thought mobile teledermoscopy would be convenient (73%), reduce worry (11%) and reduce the cost of seeing a dermatologist (8%).

Conclusions: Overall, participants held largely positive views on the mobile health application designed to take photos of skin lesions to send to a dermatologist.

Learning Objectives:
• Mobile teledermoscopy can facilitate skin self-examinations
• 95% of participants were accepting of mobile teledermoscopy
• Participants felt that mobile teledermoscopy would be convenient and reduce worry

Concurrent Session 3A - Indoor Tanning Legislation and Regulations

Evaluating the Stringency and Comprehensiveness of Indoor Tanning Legislation Across Canada - Sydney Gosselin, Jennifer McWhirter

Affiliations: University of Guelph, Guelph, ON

Introduction: Canadian provinces and territories have legislation to regulate access and use of commercial indoor tanning services. How this legislation compares between jurisdictions across the country has not been studied. To assess the key components of these laws, and their breadth, depth, and stringency, we conducted a policy content analysis.

Methods: Acts and regulations were collected on the Canadian Legal Information Institute database. Supplementary information was obtained from provincial and territorial health ministry websites. A directed content analysis of legislative documents and information was conducted using a 59-variable codebook developed based on previous research and best practices around indoor tanning policy.

Results: All ten provinces and one of three territories have enacted legislation to regulate indoor tanning. Of jurisdictions with legislation, all (n=11) prohibited youth from accessing indoor tanning services. Seven (n=7, 64%) prohibited advertisement toward youth, five (n=5, 46%) restricted misleading advertisements toward youth, and two (n=2, 18%) prohibited misleading advertisements toward the general public. Ten (n=10, 91%) required at least one health warning sign to be posted. Four (n=4, 36%) indicated that regular inspections of tanning facilities were required at a specific frequency. Four (n=4, 36%) mandated the use of protective eyewear. No jurisdiction (n=0, 0%) required clients to be screened based on personal risk factors.

Conclusions: Most provincial and territorial jurisdictions in Canada have enacted legislation to regulate the indoor tanning industry. Further, youth access, restrictions on advertisements directed toward youth, and posting of warning signs were covered in most jurisdictions. There was significantly less legislative coverage of misleading advertisements, protective eyewear, screening for risk factors, and regular inspection. These gaps have implications for compliance, risk communication, and safety, which may result in suboptimal public health protection. Key strengths and weaknesses of indoor tanning legislation in Canada will be discussed, including implications for legislative amendments.

Learning Objectives:
• Gain insight into the state of indoor tanning legislation in Canada
• Understand the areas of strength of legislative coverage for indoor tanning in Canada
• Identify areas of indoor tanning legislation which may benefit from legislative amendments

UV Protection in Concrete – Sunbed Regulation in Germany - Cornelia Baldermann

Affiliations: German Federal Office for Radiation Protection, Neuherberg, Germany

Skin cancer is the most common form of cancer among fair-skinned populations. The main cause of skin cancer is ultraviolet radiation (UVR). Over the past three decades, there has been an increase in the use of artificial sources of UVR for cosmetic purposes in the form of artificial tanning devices, such as sunbeds. Exposure to UVR for cosmetic purposes in addition to solar UV exposure is unnecessarily increasing the skin cancer risk. As the European Scientific
Committee on Health, Environment and Emerging Risks (SCHER) stated, there is strong evidence of skin cancer induction following sunbed exposure with no indications for a threshold. Therefore, sunbed use should be legal regulated to minimize the skin cancer risk. The World Health Organization (WHO) informs that more than 40 national and provincial authorities around the world have now implemented outright bans or restrictions on sunbed use. Germany started with sunbed regulations in 2001 on a voluntary basis that did not achieve the desired success. Thus, 2009 and 2012 legal regulations were introduced. This presentation explains why the German voluntary certification process failed, which items are regulated in Germany, and which experiences were made so far. Obviously, legal regulations should be as restrictive as possible to achieve a minimum of consumer protection. The implementation of the given requirements should be monitored continuously. In addition, international and national standards, which have to be considered within legal regulations regarding sunbed operation and consumer orientated sunbed services, should be checked for their potency to realize UV radiation protection as required for efficient health protection.

Learning Objectives:

- Skin cancer is the most common form of cancer among fair-skinned populations.
- Exposure to UVR for cosmetic purposes in addition to solar UV exposure is unnecessarily increasing the skin cancer risk.
- There is strong evidence of skin cancer induction following sunbed exposure with no indications for a threshold.
- Regulatory regulations should be as restrictive as possible and their compliance should be monitored continuously.
- Applicable standards should be checked for their potency to realize UV radiation protection as required for efficient health protection.

A Systematic Review of Compliance with Indoor Tanning Legislation - Jessica Reimann, Jennifer McWhirter, Andrew Papadopoulos, Cate Dewey

Affiliations: University of Guelph, Guelph, ON

Introduction: Many jurisdictions have enacted indoor tanning legislation in response to the health risks of artificial ultraviolet radiation exposure. Key components of these legislations include banning minor access, posting health warning signs, and providing protective eyewear, among others. However, legislation must be complied with to be impactful. Evidence around compliance with indoor tanning legislations has not been synthesized, and is an important step toward determining changes in indoor tanning practice due to legislation.

Methods: A systematic review was conducted to obtain peer-reviewed literature about compliance with indoor tanning legislation worldwide. Six databases were searched, resulting in 12,398 citations. Fifteen studies met the inclusion criteria.

Results: Compliance with most aspects of indoor tanning legislation varied. Compliance with age restrictions ranged from 20% to 89% (mean=55%; standard deviation=27), while compliance with posting warning labels in the required locations within a tanning facility ranged from 8% to 72% (mean=44%; standard deviation=27). There was good compliance for provision of protective eyewear (84% to 100%; mean=92%; standard deviation=8). The reasons for such low and varied compliance with certain aspects of legislation, and high compliance with other aspects of legislation, will be discussed, but deserve further attention in future research.

Conclusions: Variability in compliance with indoor tanning legislation suggests there may be problems with enforcement of the legislations, which indicates they are not having their intended protective effects on the public's health. Best practices around ensuring high and consistent compliance with indoor tanning legislations will need to be determined to better protect the public from the health risks of artificial ultraviolet radiation exposure.

Learning Objectives:

1. Identify trends in compliance with key components of indoor tanning legislations.
2. Identify possible reasons for the noted trends in compliance.
3. Understand potential ways to increase compliance with indoor tanning legislations.
4. Evidence synthesis will provide researchers and policy makers with information that may help guide implementation and evaluation of indoor tanning legislation.
The Battle for an 18 Years Age Limit for Sunbed Use in Denmark 2007-2017 - Christine L. Behrens, Line Novél, Maria K. Meyer

Affiliations: Danish Cancer Society, Copenhagen, Denmark

Introduction: Sunbed use increases the risk of melanoma and it is in particular harmful for young people. Thus, an 18 years age limit for sunbed use has been on the agenda of the Danish Sun Safety Campaign since the launch of the campaign in 2007. However, in 2017 it is still legal for children of all ages to tan in sunbed facilities in Denmark. We invite you to join our journey in the past 10 years: What have we done to advocate an age limit, and which ups and downs have we experienced?

Methods: We have used a range of methods to affect the Danish politicians: meetings with various parties, hearing statements, alliances with other likeminded organizations, press work, involvement of the volunteer network of the Danish Cancer Society and contact to the Consumers’ Ombudsman about misleading marketing in the sunbed industry.

Results: After 10 years, we still do not have an age limit for sunbed use in Denmark. However, we have experienced a few other small victories along the way: In 2014, Denmark had its first sunbed legislation. The legislation contains radiation limits and registration requirements for sunbed facilities. Furthermore, it is now mandatory to put up a warning poster from the Danish Health Authority. Another victory is that the Consumers’ Ombudsman has now stated that the marketing in the Danish sunbed industry is misleading.

Conclusions: The battle is not over. Denmark still needs an 18 years age limit for sunbed use, and the Danish Sun Safety Campaign will continue to fight until the goal is reached. We have had some smaller victories in the past 10 years and our experiences are valuable for the future battle.

Learning Objectives: The audience of this presentation will hear about:

• What the Danish Sun Safety Campaign has done to push for an 18 years age limit for sunbed use
• Different public affairs tools and techniques for influencing public policy makers
• How to focus on obtaining milestones on the road to achieve the goal: An 18 years age limit for sunbed use

An Assessment of the First Year of a Ban on the Use of UV Tanning Equipment (Beds and Lamps) By Adolescents in Ontario, Canada - Loraine D. Marrett¹, John Atkinson³, Caroline Cawley¹, Jennifer McWhirter⁴, Victoria Nadalin¹, Cheryl Rosen², Thomas Tenkate⁵

Affiliations: ¹Cancer Care Ontario, Toronto, ON, ²University of Toronto, Toronto, ON, ³Canadian Cancer Society, Toronto, ON, ⁴University of Guelph, Guelph, ON, ⁵Ryerson University, Toronto, ON

Introduction: In 2014, the Ontario government enacted The Skin Cancer Prevention Act (Tanning Beds) banning the use of UV tanning equipment by those under 18 years of age, as well as requiring health- and age-related signage and use of eye protection. The objective of this study was to assess the first year impact of the Act on Ontario adolescents’ use of UV tanning equipment.

Methods: Two samples of Ontario adolescents (< 18 and in grades 7-12) completed an online survey: one immediately before the ban, and one a year later. The survey collected information on demographics, tanning beliefs/knowledge, and tanning behaviour. Respondents using tanning equipment in the previous year were asked about length, frequency and location of use; whether use was refused; awareness of signs/warning labels; and use of eye protection. Sample weights (sex, region, grade) were applied to estimates; 95% confidence intervals were produced.

Results: About 1,500 adolescents participated in the 2014 survey, and 2,300 in 2015. No significant difference in use of UV tanning equipment in the previous year was observed between 2014 and 2015 (6.9% vs. 7.9%). Most adolescents using UV tanning equipment did so in commercial facilities rather than private residences. Significantly more adolescents noticed warning signs and labels in 2015 compared to 2014 (71% vs. 51%), and were required to wear eye protection (99% vs. 92%). Most adolescents who were refused use of tanning equipment in the previous 12 months did not use the equipment that year (72%). The majority of users were aware of the health risks, but continued to tan.

Conclusions: Although there was no reduction in the proportion of Ontario adolescents using UV tanning equipment one year after the ban, other provisions in the Act did result in improvements. Current and future work is examining compliance, enforcement and awareness of the Act.
Learning Objectives:
1. Be aware of the major provisions of the Skin Cancer Prevention Act (Tanning Beds) in Ontario.
2. Understand the effectiveness of the Act on the use of UV tanning equipment by Ontario adolescents.
3. Understand the challenges of planning and completing a full evaluation of the effectiveness of the Act.

Inspections of New Regulations for Sunbeds in Norway - Sofie Ivara Nicolaissen, Hanne Kofstadmoen, Lill Tove Nilsen

Affiliations: Norwegian Radiation Protection Authority, Baerum, Norway

Introduction: Norway is one of the countries in the world with highest occurrence of melanoma. Sunbed use is classified as carcinogenic to humans and the risk of melanoma is higher when use starts in the teens and twenties (IARC, 2006). During the last years, Norway has adopted several regulations to reduce negative health effects related to sunbed use. Since 2012 there has been an 18-year age limit for sunbeds in Norway, however prior to 2017, undertakings were not obligated to have a system in place to uphold the age limit. From 2015, all undertakings offering sunbeds for cosmetic use are obliged to inform clients of the relevant risks associated with the use of sunbeds. In addition, from 2016, the operative responsible person and staff in contact with clients has to pass a competence test developed by the Norwegian Radiation Protection Authority (NRPA). In September 2017, NRPA, together with over 200 of Norway’s 426 municipalities, conducted a national inspection campaign to enforce these recent regulations, and inform both undertakings and the public about the regulations.

Methods: NRPA is the governmental body responsible for sunbeds in Norway. The supervisory power regarding solariums and the power to make the necessary individual decisions are delegated to the municipal authorities. NRPA invited all municipal authorities to participate in the campaign. All necessary documents were prepared and distributed by NRPA, and advice was given to the municipals during the campaign. NRPA will publish a report with the results and conclusions of the inspection campaign.

Results: Over 400 undertakings were inspected during the campaign, of which NRPA inspected 67. Seventy-five percent of undertakings had breached one or more of the regulations. The campaign has led to media focus. NRPA will carry out a new national campaign in 2019, to measure the effects of the 2017-campaign.

Learning Objectives:
• New regulations implemented in Norway concerning sunbeds.
• The Norwegian Radiation Protection Authority’s interpretation of regulations concerning age control systems, information to the clients and mandatory competence tests for the operative responsible person and staff in contact with clients.
• The results from the national campaign directed at undertakings offering sunbeds for cosmetic use.
• NRPA’s plans for the future with regards to cosmetic use of sunbeds.

Content analysis of indoor tanning health warning labels across Canada - Jennifer E. McWhirter¹, Alessia Borgo², Seema Mutti-Packer³

Affiliations: ¹University of Guelph, Guelph, ON, ²Cancer Care Ontario, Toronto, ON, ³University of Calgary, Calgary, AB

Introduction: Despite artificial ultraviolet radiation (UVR) increasing one’s skin cancer risk, indoor tanning (IT) remains a popular behaviour. Provincial/territorial legislation throughout Canada mandates IT facilities post health warning labels (HWLs); however, the content presented in these labels has not been studied nor evaluated. We examined Canadian IT HWL content in order to identify current IT labeling practices.

Methods: IT legislation and corresponding HWLs were collected from the Canadian Legal Information Institute and an environmental scan. Labels were coded via directed content analysis informed by the Health Belief Model, the Extended Parallel Process Model, IT behaviour research, and tobacco HWL best practices. Data were summarized using descriptive statistics.

Results: Eleven provinces/territories had IT legislation that required warning signage; labels were available for 10 jurisdictions. There were 21 English labels; 7 of these had corresponding French versions. Among the 21 labels, text content focused on legal aspects of youth access (n=15), aesthetics risks (n=13), and health risks (n=15)
including: skin cancer (n=15), eye risks (n=4), skin burns (n=3), and death (n=1). Although skin cancer was the most common health risk identified, it was rarely characterized by severity nor quantified by risk, as recommended by the Health Belief Model. Of labels with a message frame, all presented loss frame messaging (n=15). Four labels provided an informational cue to action, one addressed self-efficacy, and none conveyed the benefits of UVR avoidance or response efficacy information. No labels contained graphic images.

Conclusions: Although most jurisdictions require signage, results suggest IT HWL content may not be optimally informed by health communication theory nor best practices, raising questions about potential efficacy. Improvement of IT HWL content is recommended through development and testing of new evidence-informed labels and best practice guidelines. Strengthening IT HWL content could increase label efficacy, maximizing the impact of existing legislation on population health.

Learning Objectives:

- To understand the warning label requirements for indoor tanning across Canada
- To identify the extent to which health risks and legal aspects of youth access are communicated to indoor tanners through warning labels
- To identify the strengths and limitations of current indoor tanning warning label messaging in the context of health and risk communication best practices

Concurrent Session 3B - Primary and Secondary Prevention Initiatives

Skin Cancer Screening Among U.S. Adults, 2000-2015 - Meredith L. Shoemaker, Trevor Thompson, Meg Watson, Dawn Holman

Affiliations: CDC, Atlanta, GA, USA

Introduction: Melanoma incidence has increased among adults in the United States. Currently, the U.S. Preventive Services Task Force does not recommend total body skin examinations (TBSE) to screen for skin cancer. Although not recommended at a population level, the American Academy of Dermatology recommends that individuals with an increased risk of melanoma or a history of skin cancer see a dermatologist about regular physician screenings.

Methods: We used the 2015 National Health Interview Survey to examine associations between TBSE and demographic characteristics and skin cancer risk factors, calculating weighted prevalence estimates. With data from four years (2000, 2005, 2010, 2015), we performed logistic regression to determine the independent factors associated with having a TSBE in the last year. A race by year interaction term was included to determine if the effect of race varied over time.

Results: In 2015, one-fifth (20.6%) of U.S. adults had ever had a TSBE, including one-third of adults over age 65. TSBE was more common among females (22.4%), non-Hispanic whites (NHW) (26.8%), college graduates (31.8%), and adults living in the northeast (25.2%). Individuals who regularly used sun protection (27.8%), defined as wearing a long-sleeved shirt or wide-brimmed hat or using sunscreen, or who had been sunburned in the last year (26.7%) were more likely to have had a TSBE. Among NHW, the odds of having had a recent TSBE increased over time, with 76% greater odds in 2015 than in 2000 (CI=1.63-1.89). Since 2000, the odds of having had a recent TSBE were increasingly greater for NHW than Hispanics and non-whites.

Conclusions: TBSE rates have been increasing among NHW and are more common among certain groups in the population. More research is needed to determine which individuals are most likely to benefit from routine TSBE, while avoiding potential harms of over screening the general population.

Learning Objectives:

- Describe current recommendations for skin cancer screening by USPSTF and other leading organizations.
- Describe the current prevalence of skin cancer screening in the United States.
- Identify demographic characteristics and skin cancer risk factors associated with skin cancer screening.
- Describe how the prevalence of skin cancer screening and the effect of race varied over time.
Association Between Sunburn and Demographic Factors and Health-Related Behaviours Among Danish Students
- Maria K. Meyer¹, Anne Sofie P. Christensen¹, Janne S. Tolstrup², Peter Dalum¹, Brian Køster¹

Affiliations: ¹Danish Cancer Society, Copenhagen, Denmark, ²National Institute of Public Health, Copenhagen, Denmark

Introduction: Sunburn is associated with an increased risk of skin cancer. The Danish Sun Safety Campaign aims to reduce sunburn in the Danish population. Denmark has one of the highest incidences of melanoma in the world, despite being located fairly northern. In order to target future campaigns effectively it is relevant to investigate if there are any demographic and health-related behaviours associated with sunburns. The objective of this presentation is to assess the associations between demographic factors and health-related behaviours and sunburn among Danish students.

Method: Cross-sectional data from the Danish National Youth Study collected by the National Institute of Public Health during 2014 was used. The data consisted of 15-25 year old Danish students, and included sunburn in Denmark (N=63 991) and sunburn abroad (N=57 931). Multilevel logistic regression analysis were used to determine associations.

Results: 45 % of the students had experienced at least one sunburn in Denmark and 60 % had experienced a sunburn abroad in the past year. Females had higher odds of sunburns than males. Education and geographical region were associated with sunburns, but with opposite trends related to sunburns experienced in Denmark and abroad. Students who had been binge drinking and had a higher physical activity level (only abroad) also had higher odds of having experienced sunburns. There were no clear association in regard to age, smoking and diet and the odds of sunburn.

Conclusion: Experiencing sunburns are prevalent among young Danes, especially for people travelling abroad. Even though we found some association between demographic factors and health-related behaviours and sunburns, there are no obvious trends. This indicates that sunburns are a widespread experience among young Danes and cannot necessarily be associated with demographic factors or with other health-related behaviours. Indicating that broad population based campaigning should be the preferred intervention.

Learning Objectives:
• How sunburn is associated with demographic factors and health-related behaviours among Danish students
• Why people who go on holidays abroad is a high-risk group for skin cancer and therefore should be in focus in future campaigns.
• Why, in a Danish context, it is important to have preventive strategies, such as campaigns targeting the entire population instead of focusing on specific subgroups.

Check Your Skin! Educating the Danes to Perform Self-Skin-Examination
- Solveig Høgh Larsen, Christine L. Behrens

Affiliations: Kræftens Bekæmpelse, København Ø, Denmark

Introduction: It has been shown that melanoma can be discovered in an early stage, if you check your skin regularly and react if you discover changes. In 2016, the campaign ‘Check your skin’ was launched for the first time in corporation between the Danish Cancer Society, the Danish foundation, TrygFonden and the Danish Dermatological Society. The aim of the campaign is to get women aged 35-55 years to perform self-skin examinations and to be able to recognize possible changes in their skin.

Methods: The ‘Check your skin’ campaign is built around a webpage, where women can learn how to check their skin. The campaign was primarily promoted on Facebook. We created the Facebook page “Check your skin”, and furthermore we got access to the main Facebook page of the Danish Cancer Society. By using Facebook’s possibilities for boosting content from our pages, we were able to buy our way into the Facebook newsfeed of the target group.

Results: We evaluated the campaign by conducting a national survey among 1600 woman aged 35-55 years. The campaign was positively received. Forty percent of the women stated, that they know the campaign. Among the women, who know the campaign, 61 percent has become more aware of the importance of self-skin-examination, and 69 percent has learnt how to check their skin.

Conclusions: The campaign has been a great success. The 35-55 year old women find the campaign messages important, and have become more aware of the
importance of self-examination of their skin. The next ‘Check your skin’ campaign will be in April 2018. This time, men aged 35-55 years are also included in the target group.

Learning Objectives: This presentation will cover:

- What the Danish Sun Safety Campaign has done to get women aged 35-55 years to perform self-skin examinations and to be able to recognize possible changes in their skin.
- How to use Facebook to reach your target group.
- The benefits of a successful cooperation between a prevention campaign as the Danish Sun Safety Campaign and the Danish dermatologists.

Perceptions of Skin Cancer Prevention and Detection by Massage Therapists - Lois J. Loescher, Kelly M. Heslin

Affiliations: The University of Arizona, Tucson, AZ, USA

Introduction: Skin cancer is the most common cancer in the U.S., yet efforts to engage non-medical service providers in skin cancer risk reduction lack systematic evaluation. Massage therapists (MTs) have unique access to client’s skin, leaving them well-positioned to participate in risk reduction and prevention efforts. We examined MTs’ perceptions of their role in engaging in skin cancer prevention, viewing the skin for suspicious skin lesions, and referring clients with suspicious skin lesions to healthcare providers.

Methods: Data from an online survey of licensed MTs practicing in the U.S. (n=102) were collected between 2015-2017, and analyzed in 2017. We assessed personal skin cancer risk and preventive behaviors and practice characteristics. Open-ended responses assessed appropriateness to ask clients about skin cancer history, sunscreen use, skin assessment, referral for a suspicious lesion and follow up.

Results: Overall, participants were favorable regarding skin cancer prevention. Over half strongly agreed that they were comfortable discussing suspicious lesions and recommending that a client see a doctor whereas 50% agreed that they were comfortable sharing knowledge about skin cancer and sun safety. 93% strongly agreed/agreed that it is appropriate for an MT to refer a client with a suspicious lesion to a dermatologist; however, 41% disagreed/strongly disagreed that it is appropriate for an MT to ask a client about sunscreen use. Most participants expressed desire to participate in prevention and detection activities in their practice.

Conclusions: MTs are ideal partners in skin cancer prevention and detection due to acceptance of the topic, quality and frequency of client contact, and their stated desire to increase personal knowledge and comfort. The U.S. Surgeon General recommends creating partnerships to reduce the skin cancer burden in the U.S. Our findings underscore the need to further study MTs as community partners in skin cancer risk reduction efforts.

Learning Objectives: Following this presentation, participants will be able to:

1. Summarize massage therapists’ comfort level as a potential partner in skin cancer risk reduction.
2. List three activities that massage therapists perceive are important to engage in for skin cancer risk reduction.
3. State two limitations of online surveys.

Changes in Sun Protection Behaviour After Diagnosis of High-Risk Primary Melanoma - Lena A. von Schuckmann1, Louise F. Wilson2, Maria Celia B. Hughes3, Vanësssa Beesley3, Monika Janda3, Jolietje C. van der Pols3, B. M. Smithers3, Kiarash Khosrotehrani4, Adele C. Green1,7

Affiliations: 1School of Public Health, University of Queensland, Brisbane, QLD, Australia, 2QIMR Berghofer Medical Research Institute, Brisbane, QLD, Australia, 3University of Queensland, Brisbane, QLD, Australia, 4Queensland Melanoma Project, Princess Alexandra Hospital, The University of Queensland, Brisbane, QLD, Australia, 5Experimental Dermatology Group, The University of Queensland Centre for Clinical Research & The University of Queensland Diamantina Institute, Brisbane, QLD, Australia, 6CRUK Manchester Institute and Institute of Inflammation and Repair, University of Manchester, Manchester, United Kingdom, 7School of Exercise and Nutrition Sciences, Queensland University of Technology, Brisbane, QLD, Australia

Purpose: Melanoma survivors are at high risk of developing a second primary melanoma. Standard clinical recommendations about sun safety aim to minimise this risk, but longitudinal data are lacking in regard to patients’ compliance with sun protection advice after diagnosis.

Patients and methods: We applied repeated measures latent class analysis to information collected via a self-
administered questionnaire about primary prevention behaviour at baseline and then six-monthly for two years to patients newly-diagnosed with clinical stage IB-II melanoma in Queensland, Australia. Multivariable regression analysis was conducted to determine factors associated with behaviour trajectories.

Results: Among 448 male and 341 female melanoma patients, sunscreen use after diagnosis fell into three trajectories: ‘stable-never use’ (26% males; 12% females), ‘stable-sometimes use’ (35% males; 29% females) and ‘increased-to-often use’ (39% males; 59% females). Similar trajectories were seen for wearing long-sleeves. Most male melanoma patients had trajectories of reduced weekend sun exposure, either ‘high-to-moderate’ (60%) or ‘moderate-to-low’ (18%), although 22% remained ‘stable-high’. Among female patients, 33% had a trajectory of reduced weekend sun exposure (‘moderate-to-low’), with the remainder having trajectories of either ‘moderate-high’ (19%) or ‘stable-moderate’ (48%). Of the trajectories showing improvements in sun protection or exposure, behavioural changes occurred within 6 months of diagnosis and persisted over 2 years. Male patients, smokers, those who do not perform self-skin checks, those without a partner, those with lower education and those with at least some tanning ability were more likely to have trajectories of inadequate sun protection. Neither a past history of melanoma nor a recurrence of melanoma had an effect on the observed patterns.

Conclusion: Identifying melanoma patients with inadequate sun protection behaviours would assist clinicians to provide targeted education.

Learning Objectives:

1. Primary melanoma survivors had a sustained increase in their use of sunscreen (39% of males and 59% of females) and long-sleeves (one third of patients) and a sustained reduction in their weekend sun exposure (78% of males and 33% of females).
2. Improvements in sun protection and exposure behaviours occurred within 6 months of diagnosis and persisted over 2 years.
3. Approximately 20% of survivors did not engage in these major sun protection measures.
4. Male patients, smokers, those who do not perform self-skin checks, those without a partner, those with lower education and those with at least some tanning ability were more likely to have trajectories of inadequate sun protection.

Results of the Canadian Dermatology Association Annual Surveys: An update on Sun Exposure Awareness and Behaviours of Canadians - Sunil Kalia¹, Sheila Au¹, Joel Claveau⁴, Peter Green⁵, Lyn Guenther⁶, Alex Kuritzky¹, Richard Langley¹, Susan Poelman⁷, Jason K. Rivers¹, Cheryl F. Rosen⁸, Maxwell Sauder⁹, Ron Vender¹⁰, Marni Wiseman¹¹, Jennifer Beecker¹²

Affiliations: ¹Department of Dermatology, University of British Columbia, Vancouver, BC, ²Ottawa Hospital Research Institute; The Ottawa Hospital, Department of Medicine; University of Ottawa, Ottawa, ON, ³Photomedicine Institute, Vancouver Coastal Health, Vancouver, BC, ⁴Division of Dermatology, Laval University, Quebec City, QC, ⁵Division of Dermatology, Dalhousie University, Halifax, NS, ⁶Division of Dermatology, University of Western Ontario, London, ON, ⁷Division of Dermatology, University of Calgary, Calgary, AB, ⁸Division of Dermatology, Toronto Western Hospital, University of Toronto, Toronto, ON, ⁹Department of Dermatology, Brigham and Women’s Hospital; The Center for Cutaneous Oncology, Dana Farber Cancer Institute; Harvard Medical School, Boston, MA, USA, ¹⁰McMaster University, Hamilton, ON, ¹¹Division of Dermatology, University of Manitoba, Winnipeg, MB

Introduction: Sun protection is important because solar ultraviolet radiation exposure is the major environmental risk factor for developing skin cancer. We surveyed Canadians to study sun protection attitudes and behaviours to assist in developing targeted prevention campaigns.

Methods: Online surveys of the Canadian population were conducted from 2015 to 2017. The questions were fielded annually on Ipso’s Canadian online omnibus. Surveys were conducted in April 2015, October 2016 and September 2017, with a representative sample of 1064, 1180 and 1051 Canadians, respectively. Questions focused on: i) risks of sun exposure, ii) importance of the characteristics of sunscreens, iii) attitudes towards sun exposure and sun protection, iv) frequency of sun protection behaviours.

Results: Sunburn was identified as the most common risk of sun exposure by respondents of all age cohorts. Increased risk of skin cancer was the second most common risk factor identified, with rates increasing in older age cohorts. Premature skin aging and increased brown spots were more commonly identified as risks by older age cohorts, whereas acne breakouts, peeling skin
and tanning were more commonly identified by younger cohorts. Although over 90% of respondents agreed that “It’s essential to protect your skin from the sun,” 67.8% (+/- 1.8%) of individuals report they “really like being in the sun despite the potential dangers.” A higher percentage of individuals reported wearing sunscreen all year around in 2017 (26.2% +/- 2.1%) compared to 2015 (17.1% +/- 2.0%).

Conclusion: Knowledge and attitudes reflect that the majority of Canadians are aware that ultraviolet radiation exposure is a major cause of skin cancer. However, a large proportion of Canadians report that they like being in the sun despite potential dangers. Different risk factors of sun based on age cohorts have been identified that can be used in targeted prevention campaigns.

Learning Objectives:
• characterize opinions and attitudes towards sun exposure prevention
• study trends in sun exposure prevention behaviors
• identify trends within age cohorts to support targeted prevention initiatives

Minorities and Skin Cancer Evaluations: A HINTS Analysis - Jennifer Nguyen

Affiliations: National Cancer Institute, Bethesda, MD, USA

Introduction: The population of focus for skin cancer prevention and screening has largely been Caucasian women. Minorities have been largely excluded from the conversation, but Hispanics and Asians are one of the fastest growing US demographics. African American patients were more likely to be diagnosed with later stages of melanoma and had the worst prognosis and lowest overall survival rate. Changing social norms, increasing acculturative behaviors, and issues of colorism add to the complexity of tanning behaviors. Little is known if minorities are engaging in skin examinations, either by self or professionals. This project aims to characterize nationally-representative rates of self-skin and professional skin examinations (SSE and PSE, respectively).

Methods: Using the National Cancer Institute’s Health Information National Trends Survey (HINTS), weighted analyses were completed to (i) identify rates of SCE and PCE among minorities and (ii) compare rates of SCE and PCE among minorities against non-minorities.

Results: 5.9% of minorities reported performing a SSE and 3.4% reported getting a PCE. Minorities were significantly less likely to have conducted a SSE (OR = 0.185, p<.001, 95% CI = 0.130, 0.264). Self-identified minorities were also significantly less likely to report a PSE (OR = 0.204, p<0.001, CI = 0.136, 0.305).

Conclusions: Low rates of self and professional skin examinations may be indicative of poor rates of skin cancer knowledge among minorities. Skin cancer is not limited to indoor tanners or Caucasian individuals. Increasing awareness about skin cancer prevention and screening may facilitate early diagnosis and treatment. This may result in less financial burden and ultimately, save lives.

Learning Objectives:
1. Describe rates of self skin cancer examination among minorities.
2. Describe rates of profession skin cancer examination among minorities.
3. Determine if rates of self and professional skin cancer exams differ between minorities and non-minorities.

Concurrent Session 3C - Updates and New Considerations on Sunscreen Use

Cancers in Australia Attributable to Exposure to Solar Ultraviolet Radiation and Prevented by Regular Sunscreen Use - Catherine M. Olsen, Louise Wilson, Rachel E. Neale, Adele C. Green, David C. Whiteman

Affiliations: QIMR Berghofer Medical Research Institute, Brisbane, QLD, Australia

Introduction: Ultraviolet radiation (UVR) is a carcinogen and the main source of exposure to UVR is the sun. We aimed to estimate the proportion and numbers of cancers occurring in Australia in 2010 attributable to UVR and the proportion and numbers prevented by regular sunscreen use. We also sought to estimate the likely impact on melanoma incidence of a range of intervention scenarios intended to increase sunscreen use.

Methods: We estimated the population attributable fraction (PAF) and numbers of melanomas and keratinocyte cancers (i.e. basal cell carcinomas [BCC] and squamous cell carcinomas [SCC]) due to exposure to ambient UVR, calculated as the proportional difference...
between incidence in Australia and incidence in ethnically similar populations exposed to lower levels of sunlight. We also estimated the prevented fraction (PF): the proportion of cancers that would have occurred but were likely prevented by regular sunscreen use. Finally, we calculated the potential impact fraction (PIF), the proportional difference between the observed number of melanomas arising under prevailing levels of sunscreen use compared with the number expected under counterfactual scenarios.

Results: Conservatively, we estimate that 7220 melanomas (PAF 63%) and essentially all keratinocyte cancers occurring in Australia in 2010 were attributable to high ambient UVR. An estimated 14,192 (PF 9.3%) and 1729 (PF 14%) people would otherwise have developed SCC or melanoma, respectively, but were prevented through regular sunscreen use. Under a plausible public health intervention scenario comprising incremental increases in sunscreen use over a 10-year period, we estimated that 28,071 fewer melanomas would arise cumulatively to 2031 in Australia (PIF 10%).

Conclusions: A very high proportion of skin cancers in Australia are attributable to high ambient UVR. Prevailing levels of sunscreen use probably reduced skin cancer incidence by 10-15%. Interventions to increase sunscreen use would result in modest reductions in melanoma incidence.

Learning Objectives:
• Most skin cancers are preventable.
• Interventions to increase sunscreen use could reduce incidence of melanoma by approximately 10% in high incidence populations.
• Regular sunscreen use should be promoted as component of a comprehensive sun protection strategy.

Sunscreen Use and Melanoma Risk in Young Australian Adults - Anne E. Cust¹, Caroline Watts¹, and Australian Melanoma Family Study Investigators

Affiliations: ¹The University of Sydney, Sydney, NSW, Australia, ²Melanoma Institute Australia, Sydney, NSW, Australia

Background: Sunscreen use is recommended to reduce skin cancer risk. There are limited data about the association between sunscreen use and risk of early-onset melanoma and factors associated with sunscreen use in young adults.

Objectives: To examine correlates of early-life sunscreen use and the association between sunscreen use and risk of cutaneous melanoma diagnosed in young adulthood (< 40 years).

Methods: The Australian Melanoma Family Study was a population-based case-control-family study. Cases were aged between 18-39 years with a confirmed first primary invasive melanoma; controls were recruited through the electoral roll, or as a friend, partner or sibling of cases. Self- and parent-reported sunscreen use and sun exposure at different ages were collected by interview. Using data from 603 cases with a confirmed first primary invasive melanoma at 18-39 years and 1,088 controls (478 population controls and 610 siblings of cases), we estimated odds ratios (OR) using logistic regression adjusted for potential confounders.

Results: Regular users of sunscreen were more likely to be female, have younger age, higher education, lighter skin pigmentation, British or northern European ancestry and report a previous blistering sunburn. Sunscreen use was associated with a lower risk of early-onset melanoma when based on childhood exposure (OR for highest versus lowest tertile 0.60, 95% CI 0.42-0.87; P-trend 0.02) and lifetime exposure (OR 0.65, 95% CI 0.45-0.93; P-trend 0.07). Total lifetime sun exposure was unrelated to melanoma risk (OR 0.97; 95% CI 0.66-1.43, P-trend 0.94), but when total sun exposure was inversely weighted for sunscreen use (0 always use to 1 never use) there was a strong association with risk (OR 1.80, 95% CI 1.22-2.65; P trend <0.01).

Conclusion: Our results support a reduced risk of early-onset melanoma with regular sunscreen use.

Learning Objectives:
• To examine factors associated with early-life sunscreen use
• To examine the association between sunscreen use and risk of melanoma diagnosed in young adulthood
• To examine if sun exposure hours ‘unprotected’ by sunscreen are associated with increased melanoma risk
Sunscreen Application and Vitamin D Status: A Systematic Review - Rachel E. Neale¹, Shanchita Khan¹, Robyn M. Lucas², Catherine M. Olsen¹, David C. Whiteman¹

Affiliations: ¹QIMR Berghofer Medical Research Institute, Brisbane, QLD, Australia, ²Australian National University, Canberra, ACT, Australia

Introduction: Regular sunscreen application prevents skin cancer, but there are concerns that it may decrease vitamin D production, leading to increased risk of vitamin D deficiency. It is important to understand the impact of sunscreen on vitamin D in order to develop skin cancer prevention policies that balance the risks and benefits of sun exposure.

Methods: We conducted a systematic review of literature according to PRISMA guidelines. Inclusion criteria were: published in English as a full manuscript after 1970; research conducted in humans; included a measure of sunscreen use, either objectively measured or self-reported; reported on the association between sunscreen use and either 25(OH)D concentration or prevalence of vitamin D deficiency. We used quality assessment scales to assess the quality of the retrieved manuscripts, predominantly the Newcastle-Ottawa Scale for cross-sectional studies.

Results: We identified 73 relevant studies. The 5 studies that used artificial ultraviolet radiation (UVR) sources found that application of sunscreen abrogated the UVR-induced increase in 25(OH)D concentration. Two population-based trials in which participants were randomised to daily application of an SPF 15 sunscreen versus placebo / discretionary use found no difference in 25(OH)D concentration or prevalence of vitamin D deficiency. We used quality assessment scales to assess the quality of the retrieved manuscripts, predominantly the Newcastle-Ottawa Scale for cross-sectional studies.

Conclusions: There is little evidence that sunscreen use increases risk of vitamin D deficiency. However, the evidence base is weak and there are no randomised trials of high SPF sunscreen conducted in environments that vary according to ambient ultraviolet radiation.

Learning Objectives:
1. To review the effect of sunscreen application on 25(OH)D concentration or vitamin D status
2. To consider the quality of the current evidence and consider whether additional evidence is required
3. To consider the implications for sunscreen policy

Sunscreen: An Ambiguous Tool - Findings from an Ethnographic Study Among Danes On Holiday - Nynne Sahl Frederiksen, Christina S. Krüger-Jensen

Affiliations: Danish Cancer Society, Copenhagen, Denmark

Introduction: Skin cancer is the most common form of cancer in Denmark. Danish holiday goers get 40% of an average indoor worker’s yearly UV-radiation during one week of holiday, and 33% of Danes travelling to sunny destinations report having been sunburnt. A qualitative study was conducted to explore the role of tanning and sun protection among Danes on holiday.

Methods: The analysis is based on ethnographic fieldwork conducted on Mallorca in July 2016 focussing on 16 Danish informants (12 women and four men aged 35-60). Data consists of participant observations and ten interviews before, during and after the informants’ holiday. Five interviews were conducted in family groups, and five interviews were conducted with individual informants.

Results: Two patterns were identified as central to the informants’ conduct in the sun. The first can be characterized as a logic of protection and the second as a logic of tanning. The logic of protection revolved around safety oriented knowledge about the risks of UV-exposure. The goal of the protection logic was to minimize the harmful effects of the sun. In contrast, the informants’ logic of tanning aimed at getting a tan by getting a lot UV-exposure. Sunburns were neither part of the protection logic nor the logic of tanning. The two logics never stood alone, but were negotiated by daily assessments of temperature, cloud coverage, activities and bodily sensations.

Conclusions: Sunscreen use was articulated as an expression of the protection logic, but was also part of the informants’ tanning practices. Sunscreen was intentionally applied in smaller doses and with lower SPF than recommended allowing the informants’ to get a tan and prolong their time in the sun. In such, sunscreen was
an ambiguous tool mediating between the informants’ two contrasting logics of both wanting to get a tan and protect their skin.

Learning Objectives: This presentation will cover:
• The role of UV-exposure as part of conceptualizations of ‘a good holiday’ among Danes on holiday at sunny destinations.
• The contrasting, but simultaneous logics of tanning and sun protection among Danes on holiday
• Examples of how sunscreen is purposely used inadequately in order to acquire a tan and prolong time in the sun
• Demonstration of the benefits of ethnographic methods to get an in-depth understanding of target groups’ logics and behaviour, and thereby strengthening our abilities towards creating effective interventions for preventing skin cancer in the future
• The key findings’ practice implications and recommendations for future interventions

How Compliant Are Australians with Their Use of Sunscreen and Other Sun Protection? - Tamara Tabbakh, Suzanne Dobbinson

Affiliations: Cancer Council Victoria, Melbourne, VIC, Australia

Introduction: Evidence from randomised controlled trials indicate that daily sunscreen use reduces skin cancer risk. However, the extent to which the general population can use sunscreen effectively is not well-elucidated. This study examines the relative protection from sunburn afforded by sunscreen and clothing and hats among Australians when outdoors on summer weekends.

Methods: The fifth National Sun Protection Survey of Australians was conducted in summer 2016-17. In cross-sectional weekly telephone interviews, a sample of N=4,508 Australians (12-69 years) were asked about their use of sunscreen on the previous Saturday and Sunday. The details of their use of clothing and hats, and sunburn occurrence on these days were also assessed. Descriptive and multivariate analyses were used to examine the relationships between protection of different areas of the body (via sunscreen application and use of covering clothing/hats) and sunburn outcomes.

Results: A similar proportion of adolescents (40%) and adults (42%) applied sunscreen when they were outdoors on the weekend. Sunscreen was most commonly applied to the face. Most sunscreen users applied sunscreen before going outdoors, while not all had used a sunscreen with maximal protection. Sunburn was inversely related to protection of the trunk with clothing (odds ratios (OR) adolescents 0.16 [95% CI, 0.04-0.63] adults 0.50 [95% CI, 0.25-0.99] and staying main under shade (OR: adolescents 0.18 [95% CI, 0.07-0.50], adults 0.42 [0.27-0.65]) and increased with time outdoors. Addition of sunscreen use to the sunburn models revealed a significant increase associated with use of sunscreen on the upper body among adolescents (OR 3.25 [95% CI, 1.50-7.05]). Consistent with this, sunscreen misapplication was commonly cited as a reason for sunburn.

Conclusions: Despite widespread use, many sunscreen users are not applying sunscreen with sufficient diligence to prevent sunburn. More education on best practice is needed.

Learning Objectives:
• To describe the prevalence of sunscreen use on summer weekends in Australia
• To build knowledge of areas of the body that people commonly protect from the sun
• To contrast the odds of sunburn when protecting different parts of the body using clothing and hats, applying sunscreen, using shade or reducing time spent outdoors

Is it Time to Change Our Public Health Advice in Relation to Sunscreen? - Craig Sinclair

Affiliations: Cancer Council Victoria, Melbourne, VIC, Australia

Introduction: Sunscreens are an important part of our sun protection advice yet at a time when the evidence of the effectiveness of sunscreen to reduce melanoma is stronger than it has ever been, public confidence in its safety appears to be declining in Australia. This presentation presents national data on perceptions about sunscreen safety and efficacy and describes challenges facing sunscreen promotion in the current Australian context.
Methods: A critical analysis was undertaken that draws data from various sources including the 2016-17 National Sun Protection Survey (NSPS), recent reviews on sunscreen effectiveness and efficacy, sunscreen advice provided from leading health agencies worldwide as well as social media posts.

Results: Data from the 2016-17 NSPS shows that just 55% of Australian adults believe all sunscreens are safe to use every day. Of concern, this is down from the 2013-14 NSPS when the figure was 61%. A number of negative media stories occurred in the lead-up to the 2016-17 NSPS, where individual experiences posted on social media achieved broad population reach and traction. Our public health communication (proactive and reactive) may be over complicating our sunscreen advice.

Conclusion: We need to improve the public’s confidence in sunscreen if we are to realise the benefits. We should encourage people to choose sunscreen (>SPF30) primarily based on how well it feels cosmetically to encourage more liberal application rather than focus on other intrinsic or technical benefits. Unless we promote the benefits to make it easier for consumer to choose based on cosmetic appeal, the impact of social media concerns will continue to undermine the general public’s confidence in the product.

Learning Objectives:
• To highlight the best available evidence on the efficacy of sunscreen to reduce skin cancer
• To challenge current thinking in terms of public health advice in relation to sunscreen
• To highlight the impact of social media on people’s perception of the safety of sunscreen
• To explore the factors contributing to the lack in confidence in sunscreen

How Sunscreens Fit into UV and Skin Cancer Prevention
- Uli Osterwalder, Alexander Schlifke

Affiliations: DSM Nutritional Products Ltd, Kaiseraugst, Switzerland

Sunscreen are an important part of UV and skin cancer prevention. Sunscreen performance is measured in vivo on the back of volunteers or in vitro by determining the transmission when applied on a PMMA plate. Both procedures are subject to considerable variability and often systematic deviation in the in vitro case. To learn more about sunscreens and their role in UV and Skin Cancer prevention we propose using an in-silico simulation tool.

The DSM Sunscreen Optimizer (www.sunscreen-optimizer.com) is a simulation tool that supports sunscreen developers and manufacturers, but also is an educational tool that can demonstrate how sunscreens work. The calculations are based on the UV absorption spectra of the sunscreen actives taking the non-uniform sunscreen film on skin into account. For SPF determination, this calculation replaces the transmission measurement of the in vitro method.

In silico calculations are by nature very consistent and still rather close to reality because the system had been trained by SPF in vivo values which are the gold standard. Beyond SPF and UVA protection factor many other interesting metrics can be calculated, e.g. the actual UV intensity and dose that passes a sunscreen and reaches the skin. Such exposure calculations are relevant in skin cancer prevention. So, it is amazing to see that sunscreens that pass the conventional broad-spectrum criterion may differ in total UV transmission by a factor of two or three. Such differences are being observed between US sunscreen and European sunscreen.

In conclusion, in silico performance calculations yield insight and understanding of sunscreens, which in turn can be used to design prevention strategies and performance requirements and also to demonstrate the benefit of certain UV filters.

Learning Objectives:
• There are three methods to assess sunscreen performance: in vivo (gold standard), in vitro and in silico
• In silico calculations are efficient and accurate enough to provide relevant information on sunscreen performance
• Sunscreens may differ by factor two to three in total UV transmission although their traditional performance claims (SPF, broad-spectrum) are the same.
Concurrent Session 4A - On the Job: Sun Protection for Outdoor Workers

Estimated Cost of Occupational Sun Protection Policy Intervention Delivery to Public-Sector Employers - Richard Meenan1, David Buller1, Barbara Walkosz2, Rachel Eye1, Mary Buller1, Allan Wallis3

Affiliations: 1Kaiser Permanante, Portland, OR, USA, 2Klein Buendel, Golden, CO, USA, 3University of Colorado Denver, Denver, CO, USA

Introduction: The cost of occupational skin cancer prevention interventions poses challenges for organizations delivering interventions and employers that implement sun protection for outdoor workers.

Methods: The Sun Safe Workplaces (SSW) intervention promoted occupational sun protection policies and education to public-sector employers (n=98) in a randomized controlled trial. Intervention components included in-person meetings and follow-up contact by email and telephone with senior managers, in-person trainings for employees, and printed educational materials sent to the workplace. Using a micro-costing approach, costs to the intervening organization were determined from the project accounting system supplemented by external sources. Costs to employers were estimated from responses to semi-structured interviews in a 2-year follow-up with senior managers (n=34) on implementing sun protection education and other actions to support employee sun safety.

Results: Total average cost of the occupational sun protection intervention was $2,697/employer (median=$2,278, sd=$1,732, range=$503-$7,428). Average intervention delivery cost for the intervening organization was $679/employer (median=$604, sd=$396, range=$262-$1,945) and for the employers, $2,018/employer (median=$1,686, sd=$1,530, range=$63-$6,655). For the intervening organization, the average cost of in-person meetings ($165/employer) and email/phone contacts ($156/employer) with managers and trainings for workers ($168/employer) were similar but lower for mailing educational materials to the workplace ($43/employer). Travel costs averaged $150/employer. Employers incurred highest average costs for implementing the training ($1,784/employer), primarily the value of employee time in attendance.

Conclusion: Costs to employers are likely a barrier to acting on skin cancer prevention. In the SSW trial, employers appeared to incur more costs than the intervening organization. Strategies to control employer costs as well as routinize sun safety education should be considered when designing occupational skin cancer prevention interventions. Costs will be used to determine the incremental cost of: (1) the SSW intervention and (2) the employers’ skin cancer prevention education and policy adoption actions induced by the SSW intervention.

Learning Objectives:

- Discuss the development of a cost effective analysis plan for an occupational skin cancer prevention program.
- Examine the use of a micro-costing approach to assess the costs of an occupational skin cancer prevention program delivered to public employers.
- Discuss how costs will be employed to determine incremental costs of the intervention and the costs to the employers that were induced by the intervention.
- Identify strategies to reduce employers’ costs of program in order to create a sustainable approach to occupational skin cancer prevention.

Solar Ultraviolet Radiation Exposure of Outdoor Workers in Three Canadian Provinces - Cheryl E. Peters1,2,3, Elena Pasko4, Thomas Tenkate4

Affiliations: 1Alberta Health Services, Calgary, AB, 2CAREX Canada, Vancouver, BC, 3University of Calgary, Calgary, AB, 4Ryerson University, Toronto, ON

Introduction: Solar ultraviolet (UV) radiation exposure places outdoor workers at risk of skin cancer. Workplaces are challenged in how to prevent over-exposure in outdoor workers. In response, the Sun Safety at Work Canada (SSAWC) project was undertaken from 2014-2016. To characterize the UV exposure of outdoor workers in the SSAWC project, personal UV exposure of participating workers was measured.

Methods: Thirteen workplaces in the provinces of British Columbia, Ontario and Nova Scotia were invited to participate in an exposure monitoring campaign (summer 2016). Workplaces included utilities or municipal/university workers. Participants wore a UV measurement device/badge on their wrist, shoulder, or hardhat. The measurement badges consisted of a light-sensitive polysulfone plastic. When exposed to UV radiation, polysulfone becomes darker and the colour change
can be quantified to a UV dose. Badge calibration and absorbance measurements were calculated in the AusSun Research Lab (University of the Sunshine Coast, Australia). Results are presented as Standard Erythemal Doses (SED) and compared to the internationally recommended exposure limit of 30J/m² (equivalent to 1.3 SED). Broad differences by covariates (location, sector type, job tasks, etc.) were calculated.

Results: The average UV exposure was 6.1 SED (nearly five times the recommended limit). Just 14% of workers had acceptable levels of solar radiation; nearly 10% were exposed at over ten times the limit. Workers in Ontario had the highest levels (mean 7.3 SED), but even in the lowest exposed province of British Columbia, mean exposure was still 4.6 SED. Utilities workers had double the exposure of municipal workers (10.4 SED and 5.5 SED, respectively).

Conclusions: Overexposure to solar UV among outdoor workers is a major issue, even in a country like Canada with relatively low ambient UV. Implementation of sun safety programs could help to support exposure reduction in this vulnerable group.

Learning Objectives:
• To understand the distribution of UV exposure values experienced by Canadian workers in three provinces
• To learn about what factors determined a worker having higher UV exposure
• To learn and discuss more about ways to reduce exposure to solar UV in outdoor workers.

The Sun Safety at Work Canada Model Sun Safety Program - T.D. Tenkate¹, D. Kramer², E. Hayes², R. Kushner², C. Peters³, P. Strahlendorf¹, D. L. Holness⁴

Affiliations: ¹Ryerson University, Toronto, Canada, ²Occupational Cancer Research Centre, Toronto, Canada, ³Alberta Health Services, Edmonton, Canada, ⁴Centre for Expertise on Occupational Disease, Toronto, Canada

Introduction: Despite being at a significant risk of skin cancer, outdoor workers are often inadequately protected and workplaces find it difficult to implement effective sun safety measures. Sun Safety at Work Canada was a national project which had as its objective the development of a sustainable sun safety program to assist workplaces effectively manage excessive sun exposure of their outdoor workers.

Methods: The project had two key phases of activity conducted between April 2014 and September 2016. In Phase 1, the project developed a sun safety program, including tools and resources, and trialled this with 17 workplaces throughout Canada. Phase 2 focused on stakeholder engagement and knowledge translation, which included the development of a website to enable public access to the developed resources.

Results: A Model Sun Safety Program was developed to enable embedding of sun safety initiatives into a workplace’s Occupational Health and Safety Management System. Nearly 100 resources were also developed to support each element of the Model Program. Feedback from trial workplaces on the resources was generally positive and helped to provide real-life considerations for implementation, however workplaces felt overwhelmed with the volume of resources produced. This feedback helped to improve the resources which were made available to the public through a purpose-deigned website.

Conclusion: The Model Sun Safety Program and resources which were produced through this project should provide a substantive resource for all workplaces to assist them in implementing effective sun safety initiatives. This presentation will provide an overview of the Model Sun Safety Program and its resources, and will describe how they were developed. The key features of the website will also be demonstrated.
Methods: The project had two key phases of activity conducted between April 2014 and September 2016. In Phase 1, the project developed a sun safety program, including tools and resources, and trialled this with 17 workplaces throughout Canada. The intervention was rigorously evaluated at three time-points using a range of qualitative approaches and quantitative approaches. Phase 2 focused on stakeholder engagement and knowledge translation, which included the development of a website to enable public access to the developed resources, and intensive engagement with industry stakeholders.

Results: The Phase 1 workplaces reported implementing 23 policy changes and 137 practice changes in their first year of implementation, and 97 new sun safety resources were developed. Three themes emerged as barriers and facilitators to the implementation of workplace sun safety initiatives: the workplace context, the intervention and the external context. In Phase 2, 57 provincial and national stakeholder organizations were engaged and a large number of communication activities were undertaken to raise the profile of occupational sun safety. A comprehensive website was launched and this received over 8000 page views in the first two months.

Conclusion: A large number of policy and practice changes were implemented across all workplaces, despite having a relatively short project timeframe. These sun safety initiatives resulted in substantial improvements at all of the workplaces and should provide a sound base for future initiatives. The stakeholder engagement activities resulted in an increased profile of the issue and laid a foundation for future policy-related action.

Learning Objectives: At the end of the presentation, attendees will have an understanding of the:

- Comprehensive methodology used to undertake a multiphased intervention and knowledge translation and exchange project.
- Barriers and facilitators associated with implementing occupational skin cancer prevention initiatives
- Barriers and facilititors associated with undertaking intensive stakeholder engagement to raise the profile of occupational sun safety

Sun Smart Lifeguards in Saskatchewan - Nicole Braun¹, Lauren Haubrich²

Affiliations: ¹Saskatchewan Cancer Agency, Sun Smart Saskatchewan, Saskatoon, SK, ²City of Prince Albert, Kinsmen Water Park, Prince Albert, SK

Introduction: Sun Smart Saskatchewan has worked for several years to promote sun safety for lifeguards as a unique population of young outdoor workers, in particular through a relationship built with the outdoor pool (Kinsmen Water Park) in Prince Albert.

Methods: Sun Smart Saskatchewan conducted a province-wide survey of pool managers and lifeguards in 2016 to assess knowledge, attitudes, and behaviours of lifeguards and determine the presence and impact of a sun safety policy. In 2017, Sun Smart worked with Kinsmen Water Park to pilot a model sun safety program based on resources from Sun Safety at Work Canada. The partners also collaborated on a video filmed at Kinsmen Water Park with local lifeguards to educate and inspire lifeguards in Saskatchewan and further enhance the culture of sun safety for lifeguards in Prince Albert.

Results: The survey found that managers and lifeguards at pools without a sun safety policy observed fewer sun safe behaviours among lifeguards compared to pools with a policy. The survey also revealed the conflicting desire among lifeguards to have tanned skin, even when the same lifeguards had awareness about sun safety. The pilot project at Kinsmen Water Park saw the introduction of incident reporting for sunburn or heat illness, a sun safety policy proposal to the city of Prince Albert, the acquisition of long sleeved uniforms, and the plan for an incentive program for staff to practice sun safety for the following summer.

Conclusion: The partnership between Sun Smart Saskatchewan and Kinsmen Water Park will continue to evolve to support sun safety. Our focus moving forward is to leverage this partnership and the resources developed to expand the impact beyond Prince Albert to the rest of the province.

Learning Objectives:

- Examine considerations for engaging a young population of outdoor workers.
- Balance occupational health and safety perspective with a consideration of the culture and influence of peers (e.g. role of social media).
• Describe knowledge, attitudes, and behaviours of lifeguards as unique and young population of outdoor workers.

• Review Sun Safety at Work Canada resources in practice. Learn about how Sun Smart Saskatchewan adapted and used resources to serve our purpose within our timeline and unique context.

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**Formative Research to Develop Sun Safety Ink! (SSI!), a Skin Cancer Prevention Training Program for Tattoo Artists** - Barbara Walkosz¹, Robert Dellavalle², Mary Buller¹, David Buller¹, Rachel Eye¹, Savanna Olivas¹

**Affiliations**: ¹Klein Buendel, Golden, CO, USA, ²University of Colorado, School of Medicine, Aurora, CO, USA

**Introduction**: 25% of American adults have a tattoo, and higher rates are found among younger generations. Sun safety promotions to young adults are significant because risk factors are elevated for this population. Tattoo artists may be ideal sources for delivering effective sun safety interventions to this hard-to-reach, at-risk population because sun safety is recommended for tattoo aftercare and the long-term.

**Methods**: Semi-structured interviews with tattoo artists and focus groups with tattooed individuals gathered input on the design of the Sun Safety Ink! (SSI!) online training program for tattoo artists.

**Results**: Tattoo artists (n=9) had limited knowledge of skin cancer but reported they alert clients if they observe skin abnormalities. All artists provided written and verbal aftercare instructions that included sun safety recommendations, but only for tattoos. Artists were interested in the SSI! training program. They suggested the use of video training scenarios to help artists learn to communicate with clients and that information about skin cancer (e.g., statistics, etiology), conversation starters, and examples of sun safety practices be included.

Focus group participants (n=15) had low levels of sun protection. Participants reported most artists do not discuss health topics but were positive about receiving skin cancer prevention messages, especially during lengthy tattoo sessions. Participants noted that sun safety advice from an artist might make a difference in protecting all of their skin not just tattoos. They recommended the artist deliver sun protection information multiple times while the client is getting the tattoo, during follow-up visits, by text message, in aftercare instructions with pictures/skin cancer facts, and via social media.

**Conclusion**: Both artists and clients were supportive of SSI! Artists are viewed as trusted sources of information and have the potential to impact clients’ sun safety practices. Suggestions regarding training content and format will be incorporated into the online training for artists.

**Learning Objectives**:

• Discuss how formative research can be employed to inform an online skin cancer prevention training program.

• Identify strategies to help tattoo artists communicate about skin cancer prevention with their clients.

• Examine the clients’ perspective on receiving public health information from their tattoo artist.

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**The Role of Knowledge Brokers in Implementing Effective Occupational Sun Safety Programs** - Lindsay Forsman-Phillips¹, Thomas Tenkate², Chery Peters¹, Desre M. Kramer³, Emily Haynes⁴

**Affiliations**: ¹CAREX Canada, Vancouver, BC, ²Ryerson University, Toronto, ON, ³Occupational Cancer Research Centre, Toronto, ON, ⁴Dalhousie University Faculty of Medicine, Halifax, NS

**Introduction**: Solar radiation exposure is a largely preventable workplace hazard, but implementing effective sun safety measures is challenging for workplaces. The aim of the Sun Safety of Work Canada (SSAWC) project was to develop sun safety processes and resources to assist workplaces in implementing sun safety programs.

**Knowledge brokers are recognized as ‘the human component of knowledge translation (KT).’ Throughout the SSAWC project, knowledge brokers supported workplaces across Canada to enhance workplace sun safety. Even though, knowledge brokers add inherent value to the KT process, previous research suggests the effectiveness of knowledge brokers produces mixed outcomes.

**Methods**: A locally based knowledge broker engaged actively with each workplace to provide assessment and feedback on how to enhance workplace sun safety, sun safety resources, and sun safety training. They also supported workplace champions, and facilitated the
intervention on behalf of the research team. The adoption of sun safety programs and practices were evaluated three times in each of the 12 workplaces by conducting interviews with key informants, collecting knowledge broker reflections, and surveying workers.

Results: The knowledge brokers were, unequivocally, appreciated by the workplaces for the services they provided, which included: keeping workplaces on schedule; for providing resources tailored to the workplace’s needs; and for helping workplaces prioritize sun safety. They were also highly valued for their provision of free educational sun safety talks to workers. However, in some instances, workplaces felt they struggled to ‘keep-up’ with the knowledge broker, and due to the depth of the relationship which was developed, some workplaces felt a sense of obligation to the knowledge brokers.

Conclusion: Implementing a sun safety program can be difficult for workplaces, especially in countries like Canada with perceived lower exposure. The employment of knowledge brokers was a key to the success of the SSAWC project.

Learning Objectives:
- To understand the role of the knowledge broker in the SSAWC project, as an effective implementation strategy in an effort to enhance workplace sun safety
- To learn about the barriers and facilitators found in the SSAWC project when implementing workplace sun safety programs, and improving occupational sun safety practices
- To learn and discuss more about strategies used during the SSAWC project to reduce solar radiation exposure in outdoor workers

Concurrent Session 4B - People and Places: Examining UV Exposure and Protection

Sun Smart: Development of a Sun Protection Education Program for Primary Schools - Bart de Wolf, Kim Kruijt

Affiliations: Dutch Cancer Society, Amsterdam, Netherlands

Introduction: Sun protection programs should protect children, since sun burns during childhood are a major risk factor of skin cancer in adulthood. Children at the age of 4 until 12 spend much of their time at school, also on times when the sun is out. This makes it important that schools have a policy for sun protection and educate their pupils about sun protection. With this in mind, we developed the Sun Smart program to increase awareness and knowledge of the importance of sun protection amongst teachers, children and their parents at primary schools.

Methods: The program was developed using a bottom-up approach. First, the current status of sun protection at schools was determined using a questionnaire among directors (n=254), teachers (n=295) and children (n=178). Additionally, a qualitative study with interviews was conducted amongst children (n=8) to connect with their perceptions.

Based on the input from the studies, the Sun Smart program was developed and pre-tested among teachers and directors of 6 primary schools. This was followed by a pilot implementation of the program at 10 primary schools after which it was adapted based on the feedback of the directors, teachers and children that used the program.

Results: Sun Smart is a modular program based on inquiry-based learning that consist of i) a variety of online education material, ii) an example of a sun protection protocol iii) education for parents and teachers. Education material is differentiated in three age levels. In spring 2018, the education program will be enriched with guest lectures by dermatologists.

Conclusions: Bottom-up approaches seem promising when developing interventions that fit the target group. SunSmart has potential since during development, it involved all important stakeholders, examined the needs of the target groups and adapted the program accordingly. Future research will investigate the effectiveness of the program.

Learning Objectives:
- Teachers and parents are important target groups for influencing childrens behaviour in sun protection. The key in developing an education program is involving all the target groups, including children.
- Sun protection at primary schools is a shared responsibility of teachers and parents. Develop an education program that involves both target groups equally and that propagate this shared responsibility.
- Needs assessments are essential for developing new products, but also pre-tests and pilots in the developing phase are important for optimal connection with the target groups.
• Primary schools require education programs that are online, modular and differentiate several age levels.

Parental Sun Protective Behavior During Intentional and Unintentional Sun Exposure: A Longitudinal Study
- Karlijn Thoonen1, Francine Schneider1, Kim Kruijt2, Bart de Wolf2, Hein D. Vries1, Liesbeth V. Osch1

Affiliations: 1Maastricht University, Maastricht, Netherlands, 2Dutch Cancer Society, Amsterdam, Netherlands

Introduction: Sun burns in early childhood doubles the chances of development of melanoma in adulthood, which makes early adequate UV protection crucial. Parental sun protective behavior such as applying sunscreen is therefore of great importance. Since not only intentional tanning but also unintended sun exposure is linked to development of melanoma, interventions should focus on both situations. This study is needed to examine whether behavioral determinants play a role in intentional (e.g. going to the beach) and unintentional (e.g. going to a playground) moments, to improve the effectiveness of prevention programs.

Methods: A longitudinal study with four measurements (2016 – 2019) was conducted among Dutch parents (n=1053) of children aged between 4 to 12 years. Online questionnaires were used to measure parental sun protective behaviors and various socio-cognitive determinants of these behaviors, based on the behavioral I-Change model. Paired sample t-tests and stepwise linear regressions were conducted to determine the influence of these factors on sun protective behaviors during intentional and unintentional exposure.

Results: Parents tend to apply sunscreen more often during intentional sun exposure moments than during unintentional moments. Parents had higher risk perceptions, a more positive attitude, social norm and intention and formulated more action plans towards the use of sunscreen on their child during intentional moments. Mainly attitude and intention were correlated during intentional moments, whereas risk perception and attitude were the main predictors during unintentional moments. Knowledge, risk perception and self-efficacy were also predictors during intentional moments and self-efficacy and formulating action plans during unintentional moments.

Discussion: As significant differences exist between the prediction and performance of parental sun protection behaviors during intentional and unintentional exposure situations, this study advocates for explicit involvement of a focus on modification of parental risk perception and attitude towards sun protective behaviors during unintentional situations in interventions and prevention programs.

Learning Objectives:
1. To gain insight in underlying determinants of changing health (sun protective) behavior
2. To examine behavioral differences in various sun tanning situations
3. To be able to examine target situations in which future sunburn prevention programs can focus
4. To be able to gain further insight in specific behavioral approaches that should be used in future sunburn prevention programs.

The Garment Protection Factor (GPF): An Index for Sun-Protective Clothing that Combines Garment Coverage and UVR Transmittance
- Simone L. Harrison1,2,3, Nathan J. Downs2,1, Alex T. Rawlings1,2, Alfio Parisi2,1

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Introduction: Clothing provides a protective barrier that reduces the amount of ultraviolet radiation (UVR) reaching the skin. Industry standards for sun-protective clothing have been implemented in Australia/New Zealand, Europe, and the USA. However, ratings and labelling used for clothing marketed as sun-protective do not routinely communicate the importance of garment coverage, although evidence suggests that this may be as important in preventing skin damage as the UVR-transmittance of the fabric.

We propose a new index for sun-protective clothing called “the Garment Protection Factor (GPF)" which considers both the body surface area (BSA) covered by a garment and the Ultraviolet Protection Factor (UPF) of the fabric from which it is made.

Methods: Manikins (range of sizes and ages) were fixed to an optical bench and marked with horizontal lines at 1 cm intervals. The GPF algorithm was developed based on
the number of lines visible on clothed versus unclothed manikins and the UPF of the garment fabric.

Results: The GPF weights fabric UPF by the BSA-covered above the minimum specified in international sun-protective clothing standards for upper-body, lower-body and all-in-one garments. GPF increases with BSA-covered and UPF. Three nominal categories are proposed: $0 \leq \text{GPF} < 3$ for garments that ‘meet’ minimum standards; $3 \leq \text{GPF} < 6$ for garments that provide ‘good’ sun-protection; and $\text{GPF} \geq 6$ for garments that provide ‘excellent’ protection.

Conclusions: The proposed GPF provides a means by which garment design (in terms of proportion of skin covered) and fabric UPF can be reported in a single index. Adopting the GPF would encourage manufacturers to design sun-protective garments that exceed the minimum standard for BSA-coverage. This research may also assist efforts to standardize the evaluation and labelling of sun-protective clothing across global markets, with positive implications for consumer awareness and skin cancer prevention world-wide.

Learning Objectives:

1. Most, but not all national sun-protective clothing standards include minimum requirements for the proportion of skin covered by a garment. Under these circumstances, clothing that does not cover significant areas of skin (e.g. bikini swimwear made of high UPF fabrics such as nylon elastane) can display a UPF swing tag, allowing garments such as these to be misrepresented as being ‘sun-protective’. To overcome this problem, the revised Australian/New Zealand sun-protective clothing Standard (AS/NZS 4399:2017) introduced a minimum level of body coverage that an item of clothing needs to achieve in order to be able to display or claim a UPF rating.

2. We propose a new classification system for sun-protective clothing called the Garment Protection Factor (GPF). The GPF is based on an easy to calculate metric that incorporates both the UPF of the fabric and the proportion of the body surface that is covered by the garment.

3. The GPF rating system provides a mechanism for the fair assessment of the sun-protective qualities of garments of different types and sizes.

4. The GPF rating system would enable consumers to make a more informed choice when purchasing sun-protective clothing. The GPF rating system should also provide an incentive for manufacturers to design sun-protective garments that exceed the minimum standards for body surface coverage.

Clinical Counseling on Sun Protection and Indoor Tanning Avoidance: A Survey of Current Practices

- Dawn M. Holman¹, Jin Qin¹, Elizabeth A. Gottschlich², Sophie J. Balk³

Affiliations: ¹Centers for Disease Control and Prevention, Division of Cancer Prevention and Control, Atlanta, GA, USA, ²American Academy of Pediatrics, Department of Research, Elk Grove Village, IL, USA, ³Children’s Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, NY, USA

Introduction: The US Preventive Services Task Force (USPSTF) recommends counseling fair-skinned individuals aged 10 to 24 years about skin cancer prevention. The purpose of this study is to examine the skin cancer prevention counseling practices of US health care providers and factors associated with regular counseling.

Methods: We analyzed data from a web-based survey of 480 family practitioners, 523 internists, 250 pediatricians, and 253 nurse practitioners (N=1,506) which asked about clinical counseling on sun protection and indoor tanning. We examined factors associated with regular counseling using multivariable logistic regression.

Results: Nearly half (48.5%) of respondents reported that counseling on sun protection is regularly provided in their practice (44.8% said occasionally; 6.8% said rarely/never) and 27.4% reported that counseling on indoor tanning is regularly provided (54.2% said occasionally; 18.3% said rarely/never). Providers most often cited lack of sufficient time as a barrier to counseling (58.1%), followed by other health concerns being more urgent (49.1%) and disinterest shown by patients (46.3%). Providers who had at least some fair-skinned patients aged 10-24 years were more likely to provide counseling on both topics. Other factors associated with counseling on sun protection included being a pediatrician, having practiced for 16+ years, having a patient population with an average household income of $50,000+, having treated sunburn in the past year, being aware of the USPSTF recommendation, and having a personal or family history of skin cancer. Factors associated with counseling on indoor tanning included being a nurse practitioner, having practiced for 16+ years, having treated sunburn in the past year, and being aware of the USPSTF recommendation.
Conclusions: Many health care providers are not regularly providing skin cancer prevention counseling. There may be value in efforts to raise awareness about USPSTF recommendations and targeting early-career providers as well as those serving lower income patient populations.

Learning Objectives: After attending this session, participants will be able to:

- Describe the current US Preventive Services Task Force recommendations regarding clinical counseling on skin cancer prevention.
- Identify potential barriers to skin cancer prevention counseling faced by health care providers.
- Discuss potential strategies for increasing the provision of clinical counseling and addressing barriers.

An Observational Study of a Novel Wearable and Continuous UVA And UVB Sensor in Melanoma Survivors - Shuai Xu\textsuperscript{1,2}, Tammy K. Stump\textsuperscript{3}, June K. Robinson\textsuperscript{1,4}

Affiliations: \textsuperscript{1}Northwestern University - Department of Dermatology, Chicago, IL, USA, \textsuperscript{2}Northwestern University - Center for Bio-integrated Electronics, 60611, IL, USA, \textsuperscript{3}Northwestern University - Department of Medical Social Sciences, 60611, IL, USA, \textsuperscript{4}Robert H. Lurie Comprehensive Cancer Center, Chicago, IL, USA

Introduction: UV-induced mutagenesis underlies the pathogenesis of melanoma. Given that the majority of melanoma patients are diagnosed at an early stage and thus able to continue to live active lifestyles, behavioral interventions to ensure safe real-world UV-exposure, mitigate survivor anxiety, and still enable outdoor activities are important aspects of cancer survivorship.

Methods: We conducted a single-arm prospective observational study of real-world UV exposure in individuals (n=39) diagnosed with an early stage melanoma (melanoma in situ, Stage IA through IIB) using a continuous wearable UV sensor (SHADE\textsuperscript{®} V1.00, YouV Labs, Inc., New York, NY) over up to 10 days during the summer in Chicago, Illinois, USA. Each sensor was individually calibrated with a limit of detection of 0.01 ultraviolet index (UVI) and linear response to 12.00 UVI. For reference, 1.00 UVI for 1 hour is 90 J/m\textsuperscript{2}. The sensor was reset every 24 hours and collected real-time UVI in 6-minute intervals.

Results: A total of 307 days of real-world UV-exposure were collected and analyzed across 39 participants. UV-exposure was detected a median of 18\% (IQR: 14\%) of the time during daylight hours with a range of 5\%-42\%. The median daily UV-exposure for each individual was 24.8 J/m\textsuperscript{2} (IQR: 34.3 J/m\textsuperscript{2}) with a range of 1.0—227.4 J/m\textsuperscript{2}. For a single-day maximum UV-exposure for each individual, the median was 124.9 J/m\textsuperscript{2} (IQR: 140 J/m\textsuperscript{2}) with a range of 9.3—552.5 J/m\textsuperscript{2} with 15\% (6/39) of participants receiving at least one day of UV exposure that exceeded the minimal erythema dose for their respective Fitzpatrick skin type.

Collectively, less than 10\% of days were missed due to participant non-compliance.

Conclusions: Melanoma survivors exhibit a wide range of real-world UV-exposure from the perspectives of median exposure and maximum daily exposure suggesting an opportunity for further educational interventions that may benefit certain higher-risk subgroups.

Learning Objectives:

- Understand the potential value of wearable UV sensing
- Understand the clinically meaningful ranges of UV-irradiation that can lead to skin erythema
- Understand the wide range of variability of UV-exposure for melanoma survivors

School-Based Primary Skin Cancer Prevention Programmes Using Real-time Personal UV Data - Alana M. Hyland\textsuperscript{1,2}, Martin W. Allen\textsuperscript{1,2}

Affiliations: \textsuperscript{1}University of Canterbury, Christchurch, New Zealand, \textsuperscript{2}MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand

New Zealand has recently overtaken Australia as the country with the highest per capita rates of skin cancer in the world, despite having a less harsh UV climate. This is largely due to a comparative lack of primary prevention initiatives. School-based interventions present a significant opportunity for influencing lifelong knowledge, attitudes, and behaviour towards UV radiation.

Excessive exposure to UV radiation and a history of sunburns in childhood and adolescence is known to significantly increase melanoma risk in adulthood. Lifetime patterns of sun exposure and protection...
are strongly influenced by knowledge, attitudes, and behaviour acquired while at school. Furthermore, a large percentage of lifetime UV exposure occurs before 18, at ages when the skin is more vulnerable to carcinogenic effects. Children in New Zealand attend school for at least 190 days a year, that includes an outdoor 50-minute lunch break close to the solar noon, a 25-minute morning interval, and a curriculum requirement for outdoor physical education classes. As such a significant proportion of childhood UV exposure occurs on school days, making school-based sun-exposure education programmes a significant primary skin cancer prevention opportunity.

In an effective new intervention, school children use real-time personal UV data acquired using lightweight, wearable electronic UV dosimeters to carry out their own investigations, collecting UV exposure data from their school environment and comparing the results against their own predictions. Activities include investigating the protection provided by hats, clothing, shade, sunglasses, and sunscreen using real-time UV data measured by themselves. By participating in a systematic investigation in their own school environment, students personally learn about the nature and risks of UV radiation rather than just being told about it.

This contribution will describe how real-time personal UV data is used to increase the efficacy of school-based skin cancer prevention programmes in New Zealand and the USA.

**Learning Objectives:**
- Real-time personal UV data has been used to increase the efficacy of school-based primary skin cancer prevention programmes.
- Students directly learn about the nature and risks of UV exposure for themselves.
- Learning outcomes can be linked to both the health and science curricula.

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**Skin Cancer and UVR Exposure Among Sexual Minorities: Results of a Systematic Review**  
Shannon Brown, Jennifer McWhirter

**Affiliations:** University of Guelph, Guelph, ON

**Introduction:** The carcinogenic effects of ultraviolet radiation (UVR) are well documented. Intentional and incidental UVR exposure behaviours are a public health concern. Sexual minorities are a medically underserved population that are disproportionately affected by cancer, but that have traditionally been overlooked in terms of skin cancer research and prevention efforts.

**Methods:** A systematic review of peer-reviewed, published literature on skin cancer and tanning among sexual minorities was conducted to: a) determine if differences exist between sexual minorities and heterosexuals regarding skin cancer history and UVR protection and exposure behaviours; and b) summarize and discuss the findings of the studies with respect to skin cancer prevention and education. Seven databases were searched (PubMed/MEDLINE, PsycINFO, Web of Science, Sociological Abstracts, ProQuest, ERIC, and ABI/INFORM). Studies were included if they were in English, peer-reviewed, dealt with skin cancer and/or UVR exposure, and focused on self-identified sexual minority participants or participant’s gender expression.

**Results:** Eight quantitative studies met the inclusion criteria. The research in this review suggests that compared to heterosexual men, sexual minority men have a higher prevalence and frequency of indoor tanning and are at increased risk of developing skin cancer during their lifetime. Looking masculine and appearing attractive were motivating factors for the increased prevalence of indoor tanning among sexual minority men. Sexual minority women appear to be less likely to engage in indoor tanning behaviours compared to heterosexual women, but findings were mixed for their skin cancer risk.

Conclusions: These results highlight the need for greater attention to, and inclusion of, sexual minority men in skin cancer education and health promotion messaging.

**Learning Objectives:**
- Identify the differences in skin cancer risk behaviours between sexual minorities and heterosexuals
- Recognize the gaps in research regarding skin cancer and sexual minorities
- Discuss potential strategies to increase sexual minority's perceived susceptibility to skin cancer
**Concurrent Session 4C - Prevention Campaigns: New Approaches and Sustained Impacts**

**The Value of Strategic PR in Campaigns for Prevention of Skin Cancer** - Christine L. Behrens, Anne F. Krarup, Peter Dalum

**Affiliations:** Danish Cancer Society, Copenhagen, Denmark

**Introduction:** Public relations (PR) is an integrated part of all the activities of the Danish Sun Safety Campaign, and we use PR as a strategic tool to make the Danish population aware of our campaign messages. To measure the impact of our PR work, we monitored all Danish press coverage about sun protection, prevention of skin cancer etc. from June 2016 to June 2017.

**Methods:** Relevant press coverage was monitored by the agency Retriever. They used specific search words containing the sun safety topic. The analysis included count of press reports, valuation of positive versus negative press coverage and calculation of ad value and Brand Building Effect (BBE). The BBE is a measure on how many media consumers that have read about our campaign and remembered the context.

**Results:** The sun safety topic was mentioned in 380 press reports from June 2016 to June 2017, and our campaign messages was mentioned in 91 percent of the press reports. In the analyzed period, we published 12 press releases. However, only 27 percent of the press coverage originated from press releases. Eighty-four percent of the press coverage was positive, while the rest was neutral. Moreover, the BBE was more than nine million, and the total ad value of the press coverage was more than 25 million DKR – equivalent to almost four million USD.

**Conclusions:** Strategic PR is an effective tool to make campaign activities and messages visible to the public. Today PR is much more than press releases, and it is important that the press perceives your organization as the one to contact in matters concerning sun safety and prevention of skin cancer. It takes hard work and planning to get the media to be interested in your agenda, but it is free of charge and the output is very valuable.

The audience of this presentation will learn:

- About the value of a strategic PR approach for a prevention campaign like the Danish Sun Safety campaign.
- How to measure the impact of PR in relation to prevention campaigns.

**Ten Years of the Don’t Fry Day Campaign**

- Kristen Sorice¹, Carolyn Heckman¹, John Antonishak²

**Affiliations:** ¹Fox Chase Cancer Center, Philadelphia, PA, USA, ²National Council on Skin Cancer Prevention, Washington, DC, USA

**Introduction:** The National Council on Skin Cancer Prevention (NCSCP; http://www.skincancerprevention.org/) is a US group of over 45 organizations, agencies, and associations of researchers, clinicians, and advocates with the goal of having a united voice to prevent skin cancer through education, advocacy, and awareness. Core members include the American Academy of Dermatology, American Cancer Society, Melanoma Research Foundation, and Skin Cancer Foundation. To address the rising rates of melanoma and publicize the dangers of UV exposure, the NCSCP created a public awareness campaign in 2009 called “Don’t Fry Day” (http://www.skincancerprevention.org/programs/dont-fry-day).

**Methods:** Don’t Fry Day (DFD), the NCSCP’s foremost activity, occurs the Friday before Memorial Day, the unofficial start of summer in the US. The objective of DFD is to encourage sun safety awareness and proper sun protection behaviors, such as seeking shade, wearing and reapplying adequate sunscreen, and avoiding tanning. The campaign is run by a committee of members, and all member organizations are asked to participate by promoting skin safety among their constituents via traditional and social media and other means.

**Results:** DFD is increasingly becoming a social (vs. traditional) media campaign. For example, in 2017, the NCSCP had 3-3.5K followers on Facebook and Twitter, respectively. In May of 2017, #DontFryDay made over 32M impressions on Twitter. The best performing Facebook post reached almost 45K people at a cost of $50. Several public figures promoted the campaign on social media (e.g., Sam Champion, Summer Sanders, Dwayne Wade).

**Conclusions:** DFD has evolved over the last 10 years and now reaches millions of individuals. The presentation will describe the evolution of the campaign over the last ten years, major activities, successes, challenges, and impact. We will also encourage attendees to participate in DFD, 2018 (May 25).
Learning Objectives:

- Attendees will be able to describe the nature of the current Don’t Fry Day campaign.
- Attendees will be familiar with the evolution of the Don’t Fry Day campaign.
- Attendees will have the opportunity to compare Don’t Fry Day to their own sun safety campaigns.
- Attendees will know how to participate in the 2018 Don’t Fry Day campaign.

The Pocket Movie Contest: A Successful Platform for Prevention of Skin Cancer - Christina S. Krüger-Jensen, Anne F. Krarup

Affiliations: The Danish Cancer Society, Copenhagen, Denmark

Background: Each year the Danish Sun Safety Campaign launches a pocket movie contest. The aim of the contest is to raise awareness of the health consequences of UV exposure and change attitudes towards sunbed use among Danish adolescents. In the contest, pupils in primary schools all over the country are producing short movies on their mobile phone addressing the theme “Unsuitable for children. Turn off the sunbed”. The objective of this presentation is to illuminate why the contest works as a successful educational effort in order to prevent unhealthy tanning behaviour.

Methods: Danish adolescents are invited to participate in the pocket movie contest. As a fixed part of the contest, the Sun Safety Campaign offers a large number of workshops for pupils aged 13-16 years. During the workshops the pupils learn about the health consequences of sunbed use. Moreover, the pupils learn how to create a campaign movie and how to deliver a message to a certain target group. The movies are submitted online and the pupils get to vote on their favourites.

Results:

- Each year around 900 pupils participate in the contest and 270 movies are submitted online.
- In 2017, the ten most popular movies had 3.345 views and got 2.412 votes in total.
- After participating in the contest 75% of the pupils indicate that they know more about the association between sunbed use and the risk of skin cancer and 46% have changed their attitude towards sunbeds.

Conclusions: Since 2009, the pocket movie contest has succeeded to involve and engage a large number of pupils. This may be due to the facilitated workshops, a combination of both educational and competitive elements – and the continuously activity. Hereby, the concept works as an ideal platform for prevention of skin cancer.

Learning Objectives:

- How a pocket movie contest is able to change attitudes towards sunbed use among pupils in primary schools.
- How to make education about prevention of sunbed relevant and useful in a primary school setting.
- How to use online workshops as a tool to expand educational programs in a primary school setting.

A National UV and Skin Cancer Strategy for Norway to Resign from the World Melanoma Throne - Lill Tove N. Nilsen, Gunnar Saxebøl, Hanne Kofstadmoen

Affiliations: Norwegian Radiation Protection Authority, Østerås, Norway

Introduction: Melanoma incidence and mortality rates in Norway are among the highest in the world, and predicted to rise for many years. The majority of cases are attributed to ultraviolet radiation exposure. This is a contradiction to our geographic location in the very north and summer UV indices seldom exceeding 6. Our fair skin and sun seeking habits both domestic and abroad as well as extensive use of artificial tanning in sunbeds the last 50 years are proposed explanations. The Norwegian Radiation Protection Authority (NRPA) and others have been working with primary and secondary prevention related to skin cancer for years, however, with limited resources and no unified efforts. The situation has led to great concern among scientist and clinicians among others, and to increased media focus and awareness among Norwegian politicians. The Ministry of Health and Care Services has therefore given an assignment to NRPA for 2017-2018 to form a national strategy to reduce skin cancer incidence and mortality.

Methods: NRPA has organized a working group with members from essential authorities and institutions with means and legal instruments to support the work and hopefully with power to facilitate changes in the skin cancer rate development. Basis for the work are the three exposure situations, regular outdoor life when in sun
shine, planned sun exposure in Norway or abroad (leisure
time and holidays) and use of sunbeds, as well as early
detection of skin cancer. Primary and secondary goals
will cover sun policy, as well as increased knowledge and
awareness on risk for skin cancer, signs of disease and
preventive measures.

Relevance: The draft strategy shall be finished by July
2018, with an implementation action plan for the period
2019 to 2023. Hopefully, the work can lead to a change,
resulting in the Norwegian resignation from the world
melanoma throne.

Learning Objectives:

• A national strategy is needed to reduce skin cancer
  incidence and mortality in Norway.
• It is essential to involve participants with means and
  legal instruments to support the work.
• Strategic goals must cover a broad range from sun
  policy to raise knowledge and awareness regarding risk
  and signs of disease.

ETSU is “Skin Smart”: Policy Adoption Aimed at
Reducing Indoor Tanning Among College Students at a
Small Southeastern University - Anthony Peluso¹, Katie
Baker¹, Sherry Pagoto²

Affiliations: ¹East Tennessee State University, Johnson City,
TN, USA, ²University of Connecticut, Storrs, CT, USA

Melanoma is among the most common cancers in
people under age 30. Incidence rates continue to rise in
certain groups, particularly among women in their 20s.
Researchers partially attribute this alarming trend to
indoor tanning (IT). College students report the highest IT
use rates of any group with 59% reporting ever-use and
43% reporting use in the past year. The National Council
on Skin Cancer Prevention (NCSCP) launched the Indoor
Tan-Free Skin Smart Campus Initiative in 2016 to address
IT among college students. In July 2016, East Tennessee
State University (ETSU) was the first to adopt the Skin
Smart Campus policy in the US. The policy addresses
recent research on campus environments and prohibits:

1) the use of tanning beds in university buildings
2) the promotion of off-campus housing that provides free
   IT access
3) the use of ETSU student debit cards for purchasing IT
   services.

The policy also requires educational programming on skin
cancer prevention be made available to students, faculty
and staff. Following policy adoption, there were several
attempts to increase awareness: a press release, a launch
event with speakers from NCSCP, and a newspaper article.
Since its adoption, it appears that few ETSU students have
heard of the policy. Since fall 2016, 8% of ETSU students
surveyed (n=1300) have reported they have heard of the
policy. However, past-year IT use among ETSU students
has declined slightly one year after policy adoption. In fall
2016, 60% of those who had ever tanned reported IT use in
the past year, compared to 55% in a fall 2017 sample. The
reason for this decline is unknown but could be related
to a push by faculty and staff to discuss the policy with
students. Campaigns to raise awareness of the Skin Smart
policy might strengthen its impact on tanning behavior.

Learning Objectives:

1. Explain the purpose of the Indoor Tan-Free Skin Smart
   Campus Initiative.
2. Describe the current activities of the Indoor Tan-Free
   Skin Smart Campus Initiative, including policy adoption
   and implementation at current Skin Smart Campuses.
3. Discuss the underlying connection between IT policy
   and behavior in a college population.

‘Help a Dane’ – A Case on How to Involve International
Ambassadors in a National Skin Cancer Prevention
Campaign - Dorte N. Dahl, Thomas Koefoed

Affiliations: Danish Cancer Society, København Ø,
Denmark

Introduction: The weather in Denmark is often dull and
the Danes love to go on holiday to sunny destinations.
This is one of the reasons, why Denmark has the fifth
highest incidence of melanoma in the world. Every year
almost 1.5 million Danes go on holiday abroad, and 60
percent return with a sunburn. To raise awareness of the
problem we engaged ambassadors in Thailand, Greece,
France, Italy and Spain - The Danes favorite holiday
destinations. The mission of the ambassadors was to ‘Help
a Dane’.

Methods: In February, we sent out a humorous appeal
on Facebook and YouTube targeting people living in the
five countries. The campaign encouraged locals to help
Danes to be more careful in the sun. We anticipated that
the Danes were more receptive if the message came from
residents at their holiday destinations. We appealed to the locals to sign up as a ‘Help a Dane’ ambassador. The ambassadors received information about melanoma incidence in Denmark and information on how to help a Dane. We also encouraged them to give their local sun safety advice.

Results: More than 11,700 ambassadors signed up to ‘Help a Dane’. Our campaign had 4,438,445 video views on Facebook during one month. We received many campaign contributions – e.g. local sun safety advices performed in Danish, support groups, videos and photos. These contributions formed the basis for the second part of our campaign, which we launched in June - targeting the Danes aged 25 to 55 travelling abroad.

Conclusions: The campaign succeeded in engaging international ambassadors. However, one of our learnings is that you need to have a clear strategy on how to involve them. When people sign up they want action now rather than later. It can be challenging to engage ambassadors throughout a campaign period of several months.

Learning objectives: This presentation will cover:

- Why involving international ambassadors in a national media campaign
- How to involve international ambassadors
- What have we learnt by engaging international ambassadors

The Danish Sun Safety Campaign 2007 – 2017: Campaign Model and Main Results - Peter Dalum, Brian Køster, Maria K. Meyer

Affiliations: Danish Cancer Society, Copenhagen, Denmark

Introduction: In 2007 Denmark had one of the highest incidences of malignant melanoma worldwide and the incidence was increasing. In order to change this development the Danish Sun Safety Campaign was launched in a partnership between the Danish Cancer Society and the philanthropic foundation TrygFonden. The aim of this presentation is to describe the overall campaign model and the main results from the campaign period.
Poster Session 1

Poster #101

Integrating Clinical and Health Promotion Practice - A Dermatology Elective Experience for Second Year Medical Students - Judith A. Purcell¹, Laura Allen³, Peter J. Green²

Affiliations: ¹Nova Scotia Cancer Care Program, Halifax, NS, ²Dalhousie University, Division of Dermatology, Halifax, NS, ³Dalhousie University, Halifax, NS

Introduction: Sun Safe Nova Scotia (SSNS) is an inter-sectoral coalition working to reduce the incidence and mortality from skin cancer in Nova Scotia, Canada. In 2011, SSNS established a dermatology elective experience through Dalhousie University's Department of Medicine exposing students to both a clinic learning experience and a health promotion project focused on a skin cancer prevention priority of the coalition. Over the past 6 years, the dermatology elective experience has been available twice per year through fall and winter term course offerings.

Methodology: An evaluation of the dermatology elective experience was conducted in 2017. A sample of students who had completed the elective participated in an on-line 20-question multiple choice and short answer survey and follow-up telephone interviews. The evaluation sought to determine the added value of integrating a health promotion project into the standard clinical elective experience.

Results: Results indicate that the dermatology elective is a positive experience for students. Specifically they believe that their projects contribute meaningfully to the objectives of the SSNS coalition and skin cancer prevention in Nova Scotia and are often inspired to continue their work beyond the elective period. In some cases students have gone on to present and publish their project work. Students reported that the clinical and health promotion experiences were reinforcing and that the demands of their health promotion projects were manageable.

Conclusion: The dermatology elective presents a unique experience for medical students who would otherwise have very limited opportunity to learn about public health promotion and community-based skin cancer prevention. Medical students contribute meaningfully to the achievement of skin cancer prevention priorities through this elective. Continuation of the integrated dermatology elective is recommended with greater emphasis placed on projects that impact direct policy change.

Learning Objectives:
• Participants will understand the concept and purpose of an integrated clinical and health promotion dermatology elective experience.
• Participants will be able to give examples of health promotion projects that have worked well in an integrated dermatology elective experience.
• Participants will be able to reflect on the strengths and weaknesses of the model presented.
• Participants will be able to assess the feasibility of transferring the Nova Scotia integrated dermatology elective model (or elements of same) to their setting/context.

Poster #102

UV Protection Evaluation using UV Shade Chart of Umbrella Type Shade - Toshimasa Kawanishi

Affiliations: Nihon University, Funabashi Chiba, Japan

Introduction: When the solar altitude is high, the direct UVR makes up 50% and the sky UVR the other 50%, because the wavelength of the ultraviolet radiation is short and are significantly scattered in the sky. It follows that, even if direct UVR is prevented using a shade, we are still exposed due to the ultraviolet radiation from the sky. Even within the shadow created by a shade, if we stay there for a long time, we will suffer the same effects as being outside the shade.

Methods: The ultraviolet radiation shade chart (UV Shade Chart) is used to visualize the strength of the ultraviolet radiation in the sky. Using the chart enables you to find out where a shade should be placed to reduce exposure to ultraviolet radiation. The chart was prepared by sorting through an enormous volume of measured ultraviolet radiation values to select the measured values for the sunny weather in summer. Using the chart, we can evaluate of umbrella type shade. It is clear that UV protection characteristics for transparency of shade material and for elevation for shade edge, for low solar altitude.
Results:
1. There is large effect for a shade material transmittance of less than 0.1. Since ASPF is 12 or higher, it is considered extremely effective. Architectural Sun Protection Factor ASPF means UV Index out of shade divided by UV Index under shade.

2. If the elevation of shade edge is lower than 25 degrees, the ASPF is 10 or more, and there is sufficient defense against the solar ultraviolet radiation. As we usually keep the edge of the parasol just above eye level in order to be able to walk safely, the elevation is around 10 degrees.

Learning Objectives: UV Shade Chart ASPF Umbrella

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**Poster #103**

**UV Photography as an Innovative, Interactive and Fun Way to Teach Children About Sun Damage and Proper Sun Protection - Maryellen Maguire-Eisen**

**Affiliations:** Children’s Melanoma Prevention Foundation, Norwell, MA, USA

CMPF aims to reduce skin cancer risk by educating children about the factors that affect UV intensity, skin sensitivity, and proper sun protection. Their SunAWARE (K-12) national curriculum has been delivered to over 500,000 American students. UV reflectance photography is an integral part of the program and is utilized to illustrate sun damage and proper sunscreen application.

Methods: CMPF has developed a SunAWARE Curriculum that meets or exceeds the Massachusetts Curriculum Frameworks, the National Common Core Standards, and the Next Generation Science Standards. Trained staff utilizes UV reflectance photography in the classroom to illustrate sun damage (freckles, moles, tanning) and proper sunscreen application (total coverage without missed areas including hairline, eyelids, ears, neck, etc.). Students rate the use of UV photography highly in terms of interest and impact. The curriculum and some companion resources are available free-of-charge to educators worldwide. Other innovative and interactive tools include a UV sensitive Frisbee, meters, apps, and a UV bracelet craft kit. Companion educational resources include an anti-tanning video and free downloadable children’s books.

Results: UV reflectance photography is an inexpensive, fun and informative way to teach children about sun damage and proper sunscreen application that can promote sun protection and reduce skin cancer risk. This technology brings our lesson alive and provides a personal snapshot of sun damage and proper sun protection. Research showed that students receiving a UV photograph were more likely to use sunscreen and had a lower incidence of sunburn at follow up (Demierre, Jrnl Derm Nurses, (2009)).

Conclusions: UV photography provides an emotionally charged experience that makes sense of the need for sun protection. It is a wonderful way to promote our mission of preventing skin cancer one child at a time.

Learning Objectives:
1. Identify how UV reflectance photography can be utilized in a skin cancer prevention health curriculum.
2. Demonstrate how UV photography illustrates sun damage and proper sunscreen application.
3. Explore how UV photography is utilized in the classroom to teach sun protection.
4. List components and cost of UV camera systems, as well as setup and utilization in school and community programs.

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**Poster #105**

**Tomorrow’s Greener Schools Today - Sandy Kambouris**

**Affiliations:** Chatham-Kent Public Health, Chatham, ON

Tomorrow’s Greener Schools Today is a schoolyard tree planting initiative, creating healthy and safe outdoor activity for students today and for generations to come. Schoolyards are hot places. Excess heat is associated with higher ultraviolet radiation exposure. Trees are most effective, at providing protection from harmful ultraviolet radiation and cooling schoolyards. Children ages 1 to 12 are more than twice as likely as adults to spend more time in the sun. One bad sunburn before the age of 18 doubles the chances of developing melanoma, the most serious and often fatal form of skin cancer. Skin cancer is the most common type of cancer and since the majority of cases are preventable, addressing ultraviolet radiation exposure has the potential to substantially impact the future burden of this disease. Furthermore, tree cover in Chatham-Kent is at an alarming low of 4.5%, the lowest in all of Ontario. Benefits of shade trees range from improved air quality, temperature regulation, road pavement life, and quality of life.
Funding was obtained from a TD Friends of the Environment grant, dedicated to supporting environmental education and green space programs, with in-kind contributions made by Chatham-Kent Public Health and the Lower Thames Valley Conservation Authority. Program information and application packages were sent to every principal across all local school boards.

Since 2013, 27 schools have participated, 1000 students have been engaged, 400 trees have been planted, and 7 community partners have collaborated on the initiative.

School-based initiatives are an efficient way to reach a large number of students inclusive of multiple geographic areas and socioeconomic levels. This initiative creates and enhances a healthy environment by addressing exposure to ultraviolet radiation and community tree coverage. This initiative works towards Chatham-Kent’s goals of reducing the burden of chronic disease, increasing tree coverage, and creating a sustainable community.

Learning Objectives:
1. List the health and environmental benefits of planting trees.
2. Explain why school-based initiatives are effective.
3. Describe how community partners and public health worked together to develop the initiative.

Poster #106

First Results of the Skin Cancer Screening Education Study (SCSES) in Alberta - Kohelia Choudhury1, Susanne Fengler2, Lynne H. Robertson3, Gordon Searles4, Rüdiger Greinert2, 5, Eckhard W. Breitbart2

Affiliations: 1 Association of Dermatological Prevention, Hamburg, Germany, 2 Association of Dermatological Prevention, Buxtehude, Germany, 3 University of Calgary, Department of Medicine, Calgary, AB, 4 University of Alberta, Division of Dermatology, Edmonton, AB, 5 Centre of Dermatology, Elbe Clinics, Buxtehude, Germany

Introduction: A key component of the German skin cancer screening (SCS) program is the mandatory training course for family physicians and dermatologists. The training includes, among other topics, the screening test and the diagnosis of skin cancer. However, the impact of the standardized training course on clinical outcomes (e.g. false-positives tests, yields of excisions) has never been evaluated. Therefore, one of the objectives of our study is to determine whether the SCS training of physicians leads to improved clinical screening outcomes.

Methods: A non-randomized, interventional study with a control group has been conducted in Alberta, Canada. Family physicians and dermatologists from Calgary and Edmonton were recruited. Physicians in Calgary were trained (intervention cohort), while physicians in Edmonton (control cohort) did not receive training. For 26-months trained physicians carried out SCS according to instructions they received in the training, whereas non-trained conducted SCS as it is standard medical practice. Screenees (residents of Alberta, age ≥ 20) were recruited by participating physicians from their own pool of patients. Until July 2017 patients were screened for melanoma and non-melanoma skin cancer. Physicians in both cohorts documented screening examinations and biopsy results on case report forms that are currently being collected.

Results: A total of 73 physicians from Calgary were trained, while 28 physicians were recruited from Edmonton. A descriptive interim analysis shows that in both cohorts more than 3,600 patients (female 73.4%) were screened and 70 malignant skin tumors were found (8 MM; 50 BCC; 10 SCC; 2 other).

Conclusions: Once data collection is complete we will determine for both cohorts the number of false-positives, the number needed to screen to detect one skin cancer as well as the number needed to excise to find one skin cancer. This will reveal whether screening outcomes are more favorable in the group of trained physicians.

Learning Objectives: Attendees will:
1. Describe the harms and benefits of routine skin cancer screenings.
2. Discuss the importance of the skin cancer screening training for primary care physicians and dermatologists.
3. Discuss how routine screening for melanoma as well as non-melanoma skin cancer can be improved for reducing morbidity and mortality.
Poster #107

Educational Outcomes of the Skin Cancer Screening Education Study: Does Screening Practice Influence Knowledge, Diagnostic Accuracy and Self-Efficacy of Physicians? - Susanne Fengler1, Kohelia Choudhury2, Rüdiger Greinert3, Beate Volkmer3, Lynne Robertson4, Gordon Searles5, Eckhard Breitbart1

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Background: The Skin Cancer Screening Education Study (SCSES) is a non-randomized intervention study including a control group with a comprehensive evaluation of skin cancer screening training of family physicians and dermatologists. A group of trained physicians were compared with a group of non-trained physicians; the study was conducted between May 2015 and July 2017 in Calgary and Edmonton, Alberta, Canada. Both groups were asked to screen for melanoma, basal cell carcinoma and squamous cell carcinoma. In the intervention group the screening followed the training program, while the control group screened according to standard medical practice in Alberta.

The training program for family physicians and dermatologists was developed in Germany for the nationwide skin cancer screening program and represents a key component; however, an evaluation of the training with a control group has not yet been conducted.

Methods: The physicians of the intervention group completed a before- and after-test at the training to identify changes in knowledge, diagnostic accuracy and self-efficacy. Twelve months into the screening phase, the physicians repeated the test online. The physicians of the control group completed the pre-test online before they started to screen participants and at the end of the screening phase. Changes in the outcomes of the third test (intervention) or the second test (control) are compared to determine whether a) screening practice has an impact on the educational outcomes and b) being part of a control group in a screening study affects educational outcomes. For statistical analysis ANOVA will be used. Ethical approval has been granted by the Health Research Ethics Board of the University of Calgary and the University of Alberta (Calgary: HREBA.CC-16-0237, Edmonton: HREBA.CC-16-0517).

Results: Up until submission deadline, results were not yet available, thus, these will be presented at the 4th International UV& Skin Cancer Prevention Conference 2018.

Learning Objectives: By reading the poster, the reader will:
1. Understand the different outcomes used for the evaluation in the before- and after-test.
2. Understand the differences of data collection in the intervention- and the control-group.
3. Be able to identify the impact the screening practice has on the educational outcomes of the participating physicians of the Skin Cancer Screening Education Study (SCSES).

Poster #108

Health Practitioners Views of Mobile Teledermatology for the Early Detection of Skin Cancer - Monika Janda1, Nicole Gillespie2, Dimitrios Vagenas1, Lois Loescher3, Clara Curiel-Lewandrowski4, Rainer Hofmann-Wellenhof5, H. Peter Soyer6

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Introduction: Health care practitioners face changes to traditional models for delivering professional services. There is little research evaluating healthcare practitioners’ views on and satisfaction with store-and-forward teledermoscopy services for the diagnosis of skin cancer.

Methods: A mixed methods survey was conducted among 59 healthcare practitioners to assess usability of store-and-forward teledermatology for when the imaging process is conducted by the healthcare practitioners themselves, or by their patients. The sample consisted of General Practitioners (n=17), dermatologists (n=22), dermatology registrars (n=18), a dermatology research fellow (n=1), and a plastic surgeon with an interest in skin cancer (n=1). Descriptive statistics were used to summarise survey data, and thematic analysis was used to extract key themes from open-ended responses.
Results: Fifty-nine healthcare practitioners completed the initial parts of the survey, and complete data was available for 44 participants (75%). More than half of the healthcare practitioners (58%, 34/59) had previously used mobile teledermoscopy or similar technology in their practice, and mostly used it for lesion monitoring and record keeping. Challenges reported were increased time to support the additional workload (45%, 23/51), technical issues (33%, 17/51), and cost of equipment (27%, 14/51). The majority of participants were either unsure (36%, 16/44) or did not advocate teledermatology for patient-performed use (41%, 18/44). Only 23% (10/44) supported the use of patient-performed teledermoscopy. The main barriers to patient-initiated teledermoscopy identified were patient education and selecting the right concerning lesions to image (36%, 16/44).

Conclusions: As imaging technology improves rapidly and becomes available on mobile devices, it is important to evaluate practitioners’ acceptance and satisfaction of evolving telehealth services. There is a need to develop better workflow and business models of practice that allow healthcare practitioners to feel comfortable engaging in ‘direct to consumer’ telehealth services.

Learning Objectives:
1. Health practitioners face changes to health care delivery with rapidly changing technology.
2. 58% of health care practitioners have previously used mobile teledermoscopy.
3. Main barrier to patient-initiated teledermoscopy is patient education.

Poster #109

Triathlon and the Potential for Solar Ultraviolet Exposure Risk Assessed During the Swim, Bicycle and Running Legs of Competitive Australian Ironman Events - Taryn Axelsen, Alfio V. Parisi, Nathan J. Downs

Affiliations: Faculty of Health, Engineering and Sciences, University of Southern Queensland, Toowoomba, QLD, Australia

Introduction: To date, no cumulative evidence has been collected on the solar ultraviolet exposure received by triathlon competitors assessing the cumulative and discrete exposure risks measured during the swim, bicycle and running legs of competitive Australian Ironman events. This sport has previously been highlighted as having potential for very high cumulative exposure given the extended requirement to be outdoors, often during peak UV exposure periods.

Methods: Miniaturized polysulphone film dosimeters manufactured at the University of Southern Queensland were attached to the posterior of a swimming cap, vertex of a bicycle helmet, and vertex of a sports cap during the swim, bicycle and running legs of competitive triathlon events held in Australia during the summer and early autumn of 2017 and 2018. Dosimeters were calibrated to ambient seasonal conditions. Exposures are presented as absolute erythemally effective values [J m⁻²] and with respect to the available ambient UV. Results were also collected during separate swimming, bicycle and running training schedules of selected athletes.

Results: Preliminary results indicate the initial swimming leg of competition resulted in the highest personal exposures, followed by the bicycle and running legs of triathlon events. Typical exposures ranged from between 20 to 50% of the available erythemally effective ambient.

Conclusion: The swimming stage of competitive triathlon events resulted in very high cumulative erythemally effective exposure despite this stage often being the shortest in terms of event duration. A possible explanation for this may be due to reflected solar ultraviolet from ocean and river surfaces highlighting the need for triathletes to cover up using full length swim suits to minimize exposure risk. Variable exposures during the bicycle and running stages of triathlon events may be due to greater variation in surface albedo and cover from surrounding tree canopies and structures encountered along course routes.

Learning Objectives:
1. Personal erythemally effective exposures, expressed as an ambient fraction and in absolute terms are presented for swim, bicycle and running legs of triathlon events.
2. Techniques in miniaturized personal ultraviolet dosimetry are highlighted.
3. Outcomes and recommendations for competitive triathletes are presented.
Poster #110

Opportunities for Melanoma Prevention Later in Life: National Data on Melanoma Incidence, Use of Sun Protection, and Prevalence of Sunburn Among Older US Adults - Dawn M. Holman¹, MaryBeth Freeman¹, Helen Ding², Meredith Shoemaker¹, Zahava Berkowitz¹

Affiliations: ¹Centers for Disease Control and Prevention, Division of Cancer Prevention and Control, Atlanta, GA, USA, ²DB Consulting Group, Atlanta, GA, USA

Introduction: Most skin cancer prevention efforts to reduce ultraviolet radiation (UV) exposure target children, adolescents, or young adults. Surveillance data can be used to identify opportunities to promote sun safety among older adults.

Methods: We used United States Cancer Statistics data (2005-2014) to examine melanoma incidence among adults aged ≥65 years. We used data from the 2015 National Health Interview Survey (NHIS) to examine sun protection and sunburn among the same age group.

Results: During 2010-2014, 170,469 cases of melanoma were diagnosed among US adults aged ≥65 years. Incidence rates were higher among men than women and increased with age, ranging from 40.3 per 100,000 among females aged 65-69 years to 175.1 per 100,000 among males aged 85+ years. Rates were highest among non-Hispanic whites (95.0 per 100,000) and lowest among blacks (4.7 per 100,000). During 2005-2014, rates increased significantly among non-Hispanic white men (average annual percent change [AAPC]=3.1) and women (AAPC=2.9) but not among other racial/ethnic groups. NHIS analyses found that shade was the most prevalent sun protection strategy used (42.2%), followed by long clothing to the ankles (37.2%), sunscreen (26.5%), wide-brimmed hats (21.7%), and long-sleeved shirts (19.3%). About 13% experienced sunburn within the past year, with a higher prevalence among non-Hispanic whites (15.0%) compared to Hispanics (8.3%), non-Hispanic blacks (6.2%), and other races/ethnicities (6.0%).

Conclusions: Melanoma incidence has increased steadily among older, non-Hispanic whites and is especially high among older white men. Many older adults do not regularly use sun protection, a missed opportunity for melanoma prevention, particularly because adults are living longer and incidence rates are highest for adults aged ≥85 years. Efforts to promote sun safety among older adults are an appropriate component of a comprehensive approach to skin cancer prevention. More work is needed to identify effective prevention interventions for this population.

Learning Objectives: After attending this session, participants with be able to:

1. Describe patterns and trends in melanoma incidence among older US adults.
4. Discuss potential opportunities for skin cancer prevention among older adults.

Poster #111

Prevention of Melanoma of the Skin Using an Online Cancer Risk Assessment Tool: My CancerIQ - Sahara Khan, Rebecca Truscott, Alice Peter, Elisa Candido, Maria Chu

Affiliations: Cancer Care Ontario, Toronto, ON

Introduction: In 2012, an estimated 3,074 new cases of melanoma were diagnosed in Ontario and 460 died from the disease. About 3,981 new cases are expected to be diagnosed in 2017. Melanoma is the most dangerous type of skin cancer, however, also largely preventable. My CancerIQ, an evidence-based online cancer risk assessment tool, allows users to complete risk assessment questionnaires for specific cancer types, obtain estimates of their cancer risk relative to Ontarians of same age and sex, and receive a personalized action plan for prevention. The melanoma risk assessment was added to My CancerIQ in February 2016.

Methods: Links to credible and local behaviour change resources are included in the personalized action plan. The melanoma action plan educates participants about modifiable (e.g., UV radiation exposure, tanning equipment use) and non-modifiable (e.g., family history) risk factors for melanoma, and provides appropriate next steps, such as recommendations for sun safety based on their current practices. To enhance uptake, Cancer Care Ontario (CCO) uses an optimized and timely communications strategy (e.g., spring, summer, popular vacation months) with social media posts on melanoma, sun safety and risk factor information.
Results: As of December 2017, approximately 35,581 melanoma risk assessments have been completed on My CancerIQ, with a 72% assessment start rate after visiting the melanoma questionnaire landing page and a 93% assessment completion rate. The majority of the completed melanoma assessments took place in early January, spring and summer months, and were directly associated with release of relevant social media posts.

Conclusion: My CancerIQ is a scientifically reliable tool that provides a powerful means to increase knowledge and awareness of cancer risk factors, including melanoma, and support Ontario’s skin cancer prevention efforts. The e-tool can be used by the general public and primary care providers to encourage discussion on cancer prevention with patients.

Learning Objectives:

1. Learn about Cancer Care Ontario’s e-tool that uses an interactive platform to increase cancer risk factor awareness among Ontarians, including risk of melanoma of the skin and prevention knowledge.
2. Learn about the uptake of melanoma risk assessments on My CancerIQ.
3. Gain information about strategies used to promote the importance of sun safety as part of the e-tool marketing and communications.

Poster #112

Assessment of Canadian UV Exposure Guidelines: Perspective from the Maritime Provinces - Michael L. MacGillivary¹, Peter J. Green²

Affiliations: ¹Dalhousie Medical School, Halifax, NS, ²Department of Dermatology, Dalhousie Medical School, Halifax, NS

The population of the Canadian Maritimes has the highest per capita rates of melanoma in Canada. Exposure to solar ultra-violet (UV) radiation, often communicated as the UV Index, is a leading cause of melanoma skin cancer. Current Canadian guidelines suggest protecting against sun exposure when the UV Index is 3 or higher which, according to these guidelines, occurs daily from 11 a.m. to 3 p.m. from April to September. The aim of this review was to compare these guidelines with UV Index data generated from the Canadian Maritimes. UV Index data, logged by Brewer spectrophotometers housed at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia from 1992 to 2001, was mined from a national database. Analysis of this data showed that the UV Index is greater than 3 from 10:45 a.m. to 2:15 p.m. in April and September, from 9:45 a.m. to 3:45 p.m. in May and August and from 9:15 a.m. to 3:45 p.m. in June and July. Given that contemporary UV Indices have likely remained as high as levels observed from 1992-2001, current Canadian sun safe guidelines inadequately demarcate when the UV Index is greater than 3 from May to August in the Canadian Maritimes. In this vein, individuals may be falsely reassured regarding the decreased risk of UV damage earlier and later in the day. While the cumulative effect of this extra unprotected UV exposure is difficult to predict, it may have particular significance to the population of the Canadian Maritimes considering the already high incidence of melanoma in this region. Therefore an extension of the current Canadian UV timeframe guidelines for the Canadian Maritimes may be warranted in order to limit exposure to UV Indices that are 3 or higher.

Conflicts of Interest: None to declare for either author

Learning Objectives: After reading this poster, the delegate should be able to:

1. Identify pitfalls of temporal sun exposure protection guidelines.
2. Consider whether temporal UV exposure guidelines in their home country adequately demarcate when the UV Index is greater than 3.
3. Analyze whether their home country would be able to implement a model similar to Australia or New Zealand in terms of communicating UV Indices to their compatriots.

Poster #113

Evaluating Ontario’s Skin Cancer Prevention Act (Tanning Beds): A Survey of Ontario Public Health Units - Jennifer E. McWhirter¹, Jessica Reimann¹, Cate Dewey¹, Andrew Papadopoulos¹, John Atkinson², Kim Bergeron³, Caroline Cawley⁴, Susan Flynn², Sasha Girden⁵, Loraine Marrett⁴, Victoria Nadalin⁴, Cheryl F. Rosen⁶, Thomas Tenkate⁷, Cathy Therrien⁸

Affiliations: ¹University of Guelph, Guelph, ON, ²Canadian Cancer Society, Toronto, ON, ³Public Health Ontario, Toronto, ON, ⁴Cancer Care Ontario, Toronto, ON, ⁵Middlesex-London Health Unit, London, ON, ⁶University
Introduction: In 2014, the Ontario government enacted The Skin Cancer Prevention Act (Tanning Beds) (SCPA) banning the use of UV tanning equipment by those under 18 years of age, as well as requiring health- and age-related signage and use of eye protection. Public Health Units are responsible for enforcing this legislation. Previous research on youth tanning behaviour in Ontario suggests the legislation may not be achieving optimal effects. The objective of this research is to better understand why this has been the case by assessing Ontario Public Health Units' knowledge of and experiences with implementation, enforcement, and compliance related to this legislation.

Methods: Each of Ontario’s 36 Public Health Units will be approached to complete a 25-question online survey about SCPA implementation, enforcement, and compliance. Both open- and closed-ended questions will be utilized. The survey will collect information on: the number and type of indoor tanning businesses in particular regions of the province; whether inspection and enforcement practices are routine or complaints-based; and the number and nature of complaints, inspections, and infractions/offences.

Results: The data collected will enable us to determine compliance of commercial indoor tanning establishments with the legislation, enforcement practices of Public Health Units related to the legislation, and general functioning of the legislation, including determining potential areas for improvement.

Conclusions: Implications of our findings for public health practice, as well as legislative strengths and potential amendments will be discussed.

Learning Objectives:

1. Review the compliance of indoor tanning businesses with this legislation.
2. Describe the enforcement practices of Public Health Units in connection to indoor tanning legislation.
3. Explain the general functioning of the legislation, including potential improvements.
4. Discuss the implications of the survey results for public health and policy makers.

A Flexible Model for Health Economic Evaluations for Melanoma and Preventive Measures in Norway - Lill Tove N. Nilsen1, Trude E. Robsahm2, Ingrid Roscher3, Ståle Navrud4, Oddbjørn Straume4, Merete Hannevik1, Marit B. Veierød5, Pål Joranger7

Affiliations: 1 Norwegian Radiation Protection Authority, Østerås, Norway, 2 Cancer Registry of Norway, Oslo, Norway, 3 Oslo University Hospital, Oslo, Norway, 4 School of Economics and Business, Norwegian University of Life Sciences, Ås, Norway, 5 University of Oslo, Oslo, Norway, 6 Haukeland University Hospital, Bergen, Norway, 7 Oslo and Akershus University College of Applied Sciences, Oslo, Norway

Introduction: Melanoma incidence and mortality rates in Norway are among the highest in the world. Exposure to ultraviolet radiation is the main environmental cause and our tanning habits play an essential role. The potential for prevention is therefore high. The Norwegian Radiation Protection Authority has been given the assignment to develop a national strategy to reduce skin cancer incidence and mortality and come up with a plan for primary and secondary preventive measures. Thus, it is essential to assess and evaluate proposed measures regarding health economic aspects.

Melanoma treatment costs vary considerably depending on tumour stage. A model using empirically estimated total costs for treatment at different stages will lack flexibility to capture future changes in melanoma treatment and costs. Therefore, we develop a flexible decision model estimating melanoma costs and survival and assess effects of various primary, secondary and tertiary preventive measures, and that is capable for cost-effectiveness analyses, cost utility analyses and cost benefit analyses to compare interventions.

Methods: Our decision analytic model uses a semi-Markov model. The model parameters are based on data from the Cancer Registry of Norway (years 2000-2015), the Norwegian Patient Registry (years 2008-2016), literature, and clinical expert opinions. The target population is patients diagnosed with melanoma. The model intends to follow the patients from the age of 18 and until death or 100 years.

Relevance: We are building the Markov-model in Excel, i.e., accessible for clinicians and epidemiologists. The
model can be used to address a range of melanoma-related themes (general model), like estimating survival and costs caused by changes in treatment and new preventive measures. Relevant scenarios are changes in diagnostic and treatment guidelines, such as increased chemotherapy costs, and health trends, such as increased background survival.

Learning Objectives:

1. A health economic evaluation model using empirically estimated total costs for treatment at different tumour stages will lack flexibility to capture future cost and treatment changes.

2. Our flexible decision model can estimate and assess melanoma cost and survival effects due to various preventive measures, as well as compare interventions.

3. A flexible model is needed to evaluate changing assumptions, as both new primary preventive measures and new guidelines for diagnostics, treatment and follow up regimes will come in question.

Poster #202

Results of the Danish Sun Safety Campaign: Cost Savings 2007-40 From Reduced Sunbed Use and Sunburn 2007-15 in the Danish Population - Brian Køster, Maria Meyer, Peter Dalum

Affiliations: The Danish Sun Safety Campaign, Danish Cancer Society, Copenhagen, Denmark

Introduction: Exposure to ultraviolet radiation is the main risk factor for skin cancer. Sunburn and Sunbed use is associated with an increased risk of malignant melanoma(MM) and keratinocyte cancers(SCC and BCC). In 2007, a long-term sun safety campaign was launched in Denmark, which decreased the prevalence of sunburn and sunbed use in the Danish population during 2007-15. We have modelled future effects of the reduction in sunburn and sunbed use 2007-15 on MM, SCC and BCC incidences 2007-40.

Methods: Melanoma and keratinocyte skin cancer incidences were modelled in the Prevent program, using population projections, historic cancer incidence, prevalence of sunburn and sunbed use and their relative risks on melanoma, basal cell carcinoma and squamous cell carcinoma, respectively. From projections, cost-savings was calculated and compared to campaign investments. A conservative scenario was applied which assumed the campaign was terminated in 2015 and that prevalence of sunbed use and sunburn reversed to 2007 levels during 2015-23. We used 2006 as the base year for the costs and a discount rate of 3 % was applied. We also included sensitivity scenarios e.g. years with increasing trend, odds-ratios and time from intervention to effect.

Results: Preliminary results of the Danish Sun Safety Campaign estimated that reduction in the number of MM, SCC and BCC cases corresponds to saved costs of 47.4 mil € during 2007-40. Of those 19.1, 17 and 11.3 mil € respectively was derived from MM, SCC and BCC. Sunburn reductions saved 12.9 mil € and reductions in sunbed use 34 mil €.

Conclusion: The Danish Sun Safety Campaign was cost-effective even in a very conservative scenario. We have shown the value of prevention and the value of long term planning in prevention campaigning. The decrease in sunburn and sunbed use during 2007-15 will have reduced future skin cancer costs significantly

Learning Objectives: This presentation will show:

1. Usage of cancer predictions translated into monetary terms.
2. Huge economic potential in skin cancer prevention.

Poster #203

Skin Cancer Risk Factors of Massage Therapy Clients: Analysis of NHIS Data - Amy L. Howarter, Lois J. Loescher

Affiliations: The University of Arizona, Tucson, AZ, USA

Introduction: Little is known about whether massage clients are an appropriate population to target for skin cancer risk-reducing interventions potentially provided by massage therapists (MTs). The purpose of this analysis was to identify massage clients’ skin cancer risk factors, including skin cancer history, age, race/ethnicity, and region of residence.

Methods: Data were obtained from the 2012 National Health Interview Survey (NHIS). The sample for this analysis was adults over age 18 years who completed the Adult Core survey and the Adult Alternative Medicine (Alt-Med) supplement. The Adult Core survey assessed skin cancer history (‘Melanoma’, ‘Skin (non-melanoma)’ and ‘Don’t know’). The Alt-Med supplement asked participants if they saw a MT in the past 12 months. Available demographic characteristics were age, race/ethnicity, and
Results: Massage clients had a slightly higher history of skin cancer (4.1%) compared to the full adult NHIS sample (3.2%, p=.01). Massage clients were predominantly female (65%); 70% were non-Hispanic white and between ages 30-65 years. Over 60% lived in the southern and western U.S. regions. We used results to develop weighted population estimates of persons who reported a skin cancer history and those who visited a MT in 2012. Nearly 8 million people reported a skin cancer history, and 15.4 million people reported having had a massage. Approximately 684,000 people (3%) who saw a MT in 2012 reported a skin cancer history.

Conclusions: A majority of MT clients report similar rates of skin cancer history as the general population, are in the lighter pigmented racial/ethnic categories, and are in the age range of 30-65, all risk factors for skin cancer. Most clients live in U.S. regions with high sun exposure. Expanding skin cancer risk reducing interventions to include MTs and their clients will broaden skin cancer risk reduction efforts.

Learning Objectives: At the completion of this presentation, participants will be able to:

1. List at least two characteristics of massage clients that increase their risk for skin cancer.
2. Describe why massage clients might be an appropriate target population for skin cancer risk reduction interventions.
3. Summarize strengths and weaknesses of using NHIS data.

Poster #204

Unintended Sunburn as an Explanation for Sunburn Paradoxes - Geraldine McLeod¹, Tony Reeder², Andrew R. Gray², Rob McGee²

Affiliations: ¹University of Otago, Christchruch, Christchurch, New Zealand, ²University of Otago, Dunedin, New Zealand

To date, very little research has examined unintended sunburn. In addition, some paradoxes have emerged in the area of skin cancer and sunburn reduction, in particular, that those with higher SunSmart knowledge; lower positive attitudes towards tanning; and who are users of sunscreen have higher odds of sunburn. It is possible that unintended sunburn may be associated with these phenomena. Therefore, those experiencing unintended sunburn may be an important group on which public health messages should be focused, as it is this group which may be most amenable to public health sunburn prevention efforts. The aim of this study is to describe unintended sunburn among New Zealanders aged 15 + using data Sun Exposure Survey data gathered by the Health Promotion Agency in 2016. Linkages will be examined between unintended sunburn and: SunSmart knowledge, attitudes towards tanning and use of sunscreen. It is hypothesised that sunburn paradoxes may be explained by unintended sunburn.

Learning Objectives:

1. Sunburn paradoxes exist in which those who use sunscreen or have higher SunSmart knowledge may be more likely to become sunburned.
2. These paradoxes may be explained by the occurrence of unintended sunburn.
3. This presentation will examine the linkages between unintended sunburn and: SunSmart knowledge, attitudes towards tanning and use of sunscreen.

Poster #205

The Updated Recommended Core Content for Sun Safety Messages in Canada - Maria Chu¹, Loraine D. Marrett¹, John Atkinson³, Robert Nuttall³, Gillian Bromfield³, Larry Hershfield³, Cheryl F. Rosen⁴

Affiliations: ¹Cancer Care Ontario, Toronto, ON, ²Canadian Cancer Society, Toronto, ON, ³Dalla Lana School of Public Health, University of Toronto, Toronto, ON, ⁴Division of Dermatology, Toronto Western Hospital, University Health Network Hospitals, and Mount Sinai Hospital and Department of Medicine, University of Toronto, Toronto, ON, ⁵Cancer Care Ontario, previously with the Canadian Cancer Society, Toronto, ON

Background: Surveys conducted in 1996 and 2006 suggest that an increasing number of Canadians are spending more time in the sun without ensuring appropriate protection against ultraviolet radiation (UVR) exposure. The incidence of melanoma has also been increasing. Consensus on information for sun safety public education messages among organizations across Canada was last achieved in 1994. Updates to messages based on developments in research have taken place inconsistently.
Research on cancer prevention practices suggests that when people are presented with ambiguous information, the likelihood of adopting practices decreases, supporting the need for consistent messages in health promotion. Work to achieve stakeholder consensus on recommended personal protection practices was undertaken as a first step to addressing increasing UVR exposure in Canadians.

Approach: Members with the Ontario Sun Safety Working Group initiated the national consensus process using recommendation statements drafted by a scientific panel. They convened a National Steering Committee and engaged a health communications expert to implement the consensus process. The process involved identifying organizations with a mandate to promote sun safety to the public; inviting representatives from these organizations to attend a workshop; conducting pre-workshop surveys with representatives to identify areas of disagreement on statements, the workshop and a post-workshop confirmation survey.

Results: The result of the consensus process is the updated Recommended Core Content for Sun Safety Messages in Canada. Four groups of statements comprise the new content: Key Facts, Primary Recommended Protective Action Statements, Additional Recommended Protective Action Statements, and Tips for Implementing the Primary Protective Actions. Organizations are encouraged to adopt, at minimum, the Primary Recommended Protective Action Statements as the basis for public messaging.

Conclusion: The recommended core content establishes a common understanding of what is needed for effective personal sun protection. This content is being tailored for different subpopulations and health promotion campaigns.

Learning Objectives:
1. An approach to achieving stakeholder consensus on public education messages.
2. The recommended core content for promoting sun safety to the public in Canada.
3. An approach to balancing scientific knowledge with practical considerations for public education messages.

Poster #206

The Value of Analysis and Evaluation Activities as Part of Campaigns for Behavioral Change - Anne Friis Krarup, Nynne Johanne Sahl Frederiksen, Maria Kristine Hagelskær Meyer, Christine Lind Behrens

Affiliations: The Danish Cancer Society, Copenhagen, Denmark

Introduction: In 2010, an analysis and evaluation program was launched as a component of the Danish Sun Safety Campaign. The aim of the program is to ensure that the Danish Sun Safety Campaign's activities are evidence-based and optimized to reach the highest possible effect. The objective of this presentation is to present the analysis and evaluation program's activities in order to highlight how such activities contribute to the goal of reducing the Danish population's exposure to UVR from natural sunlight and sunbeds.

Methods: The analysis and evaluation program consists of the following activities:

- Anthropological analysis of the target groups of the Danish Sun Safety Campaign to collect valuable qualitative insights about their life worlds.
- Qualitative pilot testing of campaign activities to prioritize between different ideas and adjust these prior to launching.
- Evaluation of campaign activities to document effort and effects.
- Annual surveys to monitor the Danish population's sun habits as an overall evaluation toll of the Sun Safety Campaign.
- Research activities in order to be up to date with and contribute to the scientific evidence about prevention of skin cancer.

Results: The analysis and evaluation program of the Danish Sun Safety Campaign has become an essential component in the work of reducing the Danish population's exposure to UVR. Furthermore, the program is valuable, when it comes to documenting the effects of the campaign. We have learned that a close cooperation and joint involvement of analysis and evaluation specialists and communication specialists is essential to building a successful evidence-based practice.

Conclusion: Based on our experiences with analysis and evaluation activities as a valuable part of the engine of the
Danish Sun Safety Campaign, it is recommended to prioritize analysis and evaluation activities as part of campaigns for behavioral change.

Key Words: Analysis, evaluation, campaigns, sun habits.

Learning Objectives: The audience of this presentation will hear about:

1. The organization of the analysis and evaluation program of the Danish Sun Safety Campaign.
2. How the different activities of the analysis and evaluation program contribute to the goal of reducing the Danish population’s exposure to UVR from natural sunlight and sunbeds.
3. How to build a successful analysis and evaluation practice in campaigns for behavioral change.

Poster #209

New Evaluations in the Danish Sun Safety Campaign: Validated One Week Questionnaires Among Danes in their Vacation - Brian Køster, Christina Schiøth, Christine L. Behrens

Affiliations: The Danish Sun Safety Campaign, Danish Cancer Society, Copenhagen, Denmark

Introduction: Exposure to ultraviolet radiation is the main risk factor for skin cancer. Sun exposure is associated with an increased risk of malignant melanoma (MM) and keratinocyte cancers (SCC, BCC). Sun exposure is mainly evaluated by retrospective questionnaires that are prone to recall bias. In 2015, the Danish Sun Safety Campaign implemented a new evaluation questionnaire, which was objectively validated and based on one-week measurements and a very short recall period. We aimed to achieve more precise and nuanced knowledge about the Danes behavior in the sun to be able to optimize preventive interventions.

Methods: Five thousand Danes aged 15-70 years were recruited by a web panel during 10 weeks from June to August 2015. The sample was representative for the Danish population on gender, age, region and education. Eligibility criteria was that the participants had been on vacation/off work for more than 4 continuous days within the past 14 days in Denmark or abroad. We used descriptive statistics for the analysis. Questions were mainly likert-scale based.

Results: In our evaluation, we showed measurements of the Danes by objectively validated exposure scale and conceptually validated attitude and knowledge scales. Additionally, we examined differential degrees of sunburn and body part specific sunburn. Almost half of the Danes were sunburned to some degree. There was a clear age gradient with the youngest being sunburned not only more often, but also more severely. Thirty-two % was sunburned in continuously exposed body sites (face, hands, feet) and 19 % were sunburned on the main torso associated to sunbathing.

Conclusion: Using these new data to complement our traditional annual evaluations has brought knowledge about target groups and especially the short data collection period reducing recall bias has given insights about how the Danes actually behaves in the compared to how they usually behave in the sun.

Learning Objectives: We show:

1. Scale based measurements which sums up concepts.
2. Objectively validated measurement which provides association to the actual behavior.

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Poster #210

Alternative Facts & Artificial Rays: Online Content Analysis of Indoor Tanning Websites - Alyssa Green, Jennifer McWhirter, Scott McEwen

Affiliations: University of Guelph, Guelph, ON

Introduction: Skin cancer is a significant, but preventable, global public health problem. Despite the cancer risks of indoor tanning (IT), over 1 million Canadians continue to engage in this behavior, which may be related to the information, misinformation, or lack of information they receive about artificial ultraviolet (UV) exposure. IT facilities use marketing to encourage the public to use their services. Little is known about the messages the IT industry uses in online contexts, and whether the content complies with advertising and marketing restrictions mandated by IT legislation.

Methods: We conducted a content analysis of IT salon websites in Ontario, Canada. We developed a comprehensive catalogue of IT salons using InfoCanada’s marketing and sales directory and YellowPages.com. Google was used to locate IT salon websites and verify the existence of each salon, along with telephone calls as
necessary. We then developed a codebook to assess the content of salon websites based on previous literature and a sample of websites. The 316 variable codebook covered 16 key categories, including the presence of health and aesthetic claims, benefits and risks of IT, and whether messages were directed towards youth.

Results: In 2017, there were 427 IT salons in Ontario. Of those, 277 had websites that were included in the content analysis. Qualitative findings demonstrated that the IT industry utilizes false health claims (e.g., tanning is safe, tanning prevents disease) and promotions to youth to sell their services (e.g., student discounts), suggesting non-compliance with provincial IT legislation. Aesthetic benefits were conveyed frequently while aesthetic risks were not.

Conclusion: This research helps to illustrate how the Ontario IT industry markets artificial UV to the public. Policy makers and health communication specialists may find this information useful towards developing counter communication strategies and legislative amendments to deter false and misleading claims, especially around health.

Learning Objectives:

1. The audience will be informed about the scope of the IT industry in Ontario, as indicated by the number of tanning salons and those which have websites with which they market their services.
2. The audience will understand the major themes of the content of the IT websites, including with respect to health information and the related compliance to advertising health policies.
3. The audience will be able to understand some of the implications of these findings for health communication and health policy.

Poster #211

Improving Health Communication: Qualitative Assessment of Perceptions and Skin Cancer Messages Among Black and Hispanic Populations - Natasha Buchanan Lunsford1, Dawn M. Holman1, Jennifer Berktold2, Karen Stein2, Adwoa Prempeh3, Adeline Yerkes3

Affiliations: 1. Centers for Disease Control and Prevention, Division of Cancer Prevention and Control, Atlanta, GA, USA, 2. Westat, Rockville, MD, USA, 3. National Association of Chronic Disease Directors, Atlanta, GA, USA

Introduction: Limited skin cancer prevention messaging exists for black and Hispanic audiences. These groups may perceive their skin cancer risk to be nominal and may be less likely to use sun protection. In 2014, The Surgeon General’s Call to Action to Prevent Skin Cancer cited the need for behavioral research to develop and implement effective, evidence-based skin cancer prevention messages and interventions for specific audiences. Subsequently, we conducted formative research to understand knowledge, awareness, beliefs/behaviors (KABB) among these groups.

Methods: Eighteen focus groups were conducted with black and Hispanic adults aged 18-44 years in four US cities. Groups were moderated using a semi-structured discussion guide and segmented by participant characteristics associated with elevated or lower risk for skin cancer, by race/ethnicity, gender, and age. Focus group transcripts were analyzed using conventional content analysis and NVIVO 11 Software.

Results: Most respondents perceived their skin cancer risk to be low, often attributed to having a “darker skin tone” and/or “lack of family history.” Skin cancer signs and symptoms were more inconsistently reported by blacks (versus Hispanics). Few participants reported regularly using sun protection. Those who did, used sunscreen, wore protective clothing, and had two or more elevated risk characteristics (light hair and eye color; outdoor occupation with sun exposure, sunburn history, or indoor tanning history). While most respondents recalled family discussions (as youth) about sunscreen application and staying out of the sun, the intent was to warn against “further skin darkening” or to “prevent aging,” instead of sun burns or skin cancer risk. Indoor tanning was low across all segments.

Conclusions: Findings may be used to improve understanding of skin cancer risk-related KABB among Hispanics and blacks. Results may also inform the development of tailored educational and public health resources to facilitate improved skin cancer prevention behaviors in these groups.

Learning Objectives: After attending this session, participants will be able to:

1. Discuss how skin cancer knowledge, awareness, and beliefs among black and Hispanic adults may create barriers to adequate sun protection behaviors.
2. Discuss some of the challenges of developing effective
skin cancer prevention messages for black and Hispanic populations and some potential solutions.

3. Discuss strategies for developing skin cancer prevention messages and materials that resonate with various racial and ethnic groups.

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**Poster #212**

**Sun Safety Toolkit for Ontario Public Health Units: A Collaborative Effort to Promote Skin Cancer Prevention**

- Gina Ing¹, Maria Chu², Chantal Duhaime³, Sasha Girden⁴, Jennifer McWhirters, Sonya Muntwyler⁶, Cheryl F. Rosen⁷, Thomas Tenkate⁸, Cathy Therrien⁹

**Affiliations:** ¹ Toronto Public Health, Toronto, ON, ² Cancer Care Ontario, Toronto, ON, ³ Environment and Climate Change Canada, Montreal, QC, ⁴ Middlesex-London Health Unit, London, ON, ⁵ University of Guelph, Guelph, ON, ⁶ Halton Region Public Health, Oakville, ON, ⁷ University Health Network, Toronto, ON, ⁸ Ryerson University, Toronto, ON, ⁹ Peterborough Public Health, Peterborough, ON

Skin cancer is the most common cancer in Canada, and rates of melanoma are increasing. Fortunately, skin cancer is largely preventable by reducing ultraviolet radiation exposure. Public education has an important role to play in this regard.

**Objective:** Adapt recommendations from "An Update to the Recommended Core Content for Sun Safety Messages for Public Education in Canada: A consensus report" in a Sun Safety Toolkit for Ontario Public Health Units.

**Methods:** Consensus recommendations were adapted to create a toolkit that included factsheets on sun safety for different contexts, such as for protecting children and outdoor recreation. A common set of factsheets was needed to facilitate the adoption of the recommended protective behaviours, streamline dissemination, and ensure message consistency for different contexts.

Key messages from the consensus report were reworded to make them directly relevant. The revised messages were vetted through the Ontario Sun Safety Working Group (OSSWG), including the authors of the consensus report. Disagreements were resolved with discussion until consensus was reached.

An environmental scan was conducted with Ontario Public Health Units to identify products most commonly used for skin cancer prevention education.

Educational products were developed based on persuasion and behaviour change best practices and research.

**Results:** The OSSWG developed a co-brandable toolkit for public health professionals to educate fellow colleagues, and staff in schools, day camps, and childcare centres, and the public at large. The toolkit was disseminated to Public Health Units via the OSSWG Medical Officers of Health.

**Conclusion:** The toolkit has seen extraordinary interest by Public Health Units, academic and research institutions, and agencies with a mandate for skin cancer prevention. In creating sun safety resources for public health practitioners, up-to-date, evidence-informed key messages should be used consistently and may serve as a springboard for future products aimed at skin cancer prevention.

**Learning Objectives:**

1. Demonstrate a process for developing evidence-based sun safety messaging, and building consensus amongst public health stakeholders, in order to ensure consistency in public education efforts aimed at reducing rates of skin cancers.

2. Understand how persuasion and behaviour change research is applied in developing educational products for skin cancer prevention.

3. Learn about the Sun Safety Toolkit for Ontario Public Health Units.

4. Learn about how the skin cancer prevention messaging can be integrated into public health practice beyond public education.

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**Poster #213**

**Implementation Strategies: Review of a Sun Safety Program in California**

- Kim Massie¹, Julia Berteletti², Brianne Freeth¹, Jeff Ashley³, Mary K. Buller², David B. Buller², Kim D. Reynolds¹

**Affiliations:** ¹ Claremont Graduate University, Claremont, CA, USA, ² Klein Buendel, Inc., Golden, CO, USA, ³ Sun Safety for Kids, Burbank, CA, USA

Introduction: The US Surgeon General’s Call to Action to Prevent Skin Cancer in 2014 emphasized the importance of sun safety for schools; however, there is limited information on how to effectively assist schools in implementing sun safety.
Methods: The Sun Safe Schools project was developed to provide technical assistance to public elementary schools in California (n=118) with the implementation of sun safety practices consistent with district board policy for sun protection (i.e., BP 5141.7). A trained coach worked with principals to select sun safety practices within policy categories (e.g., education of students; parent outreach) and develop their implementation plan. The coach recorded all reported intervention activities within a tracking database including: practice selection date, policy category, practice description, and implementation date.

Results: A variety of practices (e.g., posting UV Index; providing sunscreen) (n=129) have been implemented at 58 intervention schools. Practices were predominately implemented in the first 12 months of the 20-month program (n=105, 81%). Most practices were implemented in the spring (n=48); highest implementation occurred in May (n=30), April (n=18), and February (n=15). Low periods of implementation coincided with summer and winter breaks in the school calendar. The most frequently implemented practices included: distributing sun safety information (e.g., newsletter) to parents (n=18, 14.4%); arranging sun safety presentations for students (n=17; 13.6%); and providing a sun safety webinar to staff (n=15; 12%). Policy categories most frequently implemented included education of students (n=44, 34%); parent outreach (n=35, 27%); and education of teachers (n=21, 16%).

Conclusions: Working with schools presents unique challenges for implementation of sun safety (e.g., school personnel's preferences, seasonal breaks). To be effective, implementation assistance should be designed around the school calendar and allow the principal to determine the pace and priorities.

Learning Objectives:
1. To identify the most frequently implemented sun safety practices within California elementary schools that received a special intervention.
2. To determine an effective intervention length for sun safety implementation in elementary schools.
3. To understand the unique challenges of implementation within the structure of an elementary school calendar.
4. To understand what factors influence the implementation of sun protection practices by school administrators.

Poster #214
How to Spread Prevention Messages Through Local Ambassadors - Line Novel, Lotte R. Pålsson, Solveig H. Larsen

Affiliations: Danish Cancer Society, Copenhagen, Denmark

Introduction: Throughout the past ten years, thousands of volunteers have been involved as local ambassadors at a grassroots level in the Danish Sun Safety Campaign. Historically, the Danish Sun Safety Campaign has acted as a first mover when it comes to involving volunteers and applying bottom up strategies to communicate prevention messages. Notably, around 40% of the Danish population work as volunteers, but there is a rise in competition amongst NGOs to obtain volunteers. So, how does the Danish Sun Safety Campaign ensure volunteer engagement? Furthermore, why do volunteers play a crucial role in the communication strategy?

Methods: Through tailored concepts, handout materials and communicable messages, volunteers are promoting trustworthy messages about sun safety by working with policy implementation at municipality level, hosting sun safe events in kindergartens, festivals etc. To ensure ongoing motivation amongst existing as well as new volunteers, the Danish Sun Safety Campaign focusses on the following elements: 1. involvement; 2. creating effective and communicable material; 3. developing and adapting creative concepts; and 4. providing online education and ongoing communication with our volunteers.

Results: After ten years, hundreds of volunteers are still participating in the Danish Sun Safety Campaign on an annual basis as well as playing a crucial role in communicating trustworthy sun safety messages on all levels of Danish society. Through dialogue and further development of concepts, online platforms, communication materials and education, the campaign aims to maintain engagement and support amongst our volunteers despite the increasing competition from other NGOs.

Conclusion: The Danish Sun Safety Campaign relies on the credibility provided by our volunteers in their role as local ambassadors spreading the sun safety messages. Their effort is thus highly valuable in the prevention of skin cancer amongst the Danish population. Therefore, we are
also extremely dependent on keeping existing and new volunteers motivated.

Learning Objectives:
1. How to maintain volunteer engagement despite increasing competition from other NGOs or projects.
2. How to understand volunteers as valuable local ambassadors and messengers.
3. Understanding the complexity of involving volunteers in developing new concepts.

Poster #215

Optimizing Volunteer Materials on Sun Safety Through Involvement - Lotte R. Pålsson, Line Novél

Affiliations: Danish Cancer Society, Copenhagen, Denmark

Introduction: The Danish Sun Safety Campaign is mobilizing volunteers as local communicators of sun safety messages in kindergartens. In an initiative called ‘The local sun week’ the aim is to implement sun policy in kindergartens in Denmark and to teach children about sun protection through a pedagogical approach. Volunteers have carried out visits in kindergartens every spring since 2008. In this work, materials play an important role in framing the meeting between volunteers, kindergarten teachers and children.

Methods: In order to optimize communication and the materials in the ‘The local sun week’, we conducted an evaluation in the fall 2017, where both volunteers and the target group were involved. The evaluation results made the basis of the next involving process with volunteers, kindergarten teachers and children. For instance, one book was found not suiting for the age group and hard to read aloud for volunteers during their visits. Therefore, we made a new book communicating sun safety to children better suiting the age group. Volunteers and kindergarten teachers gave feedback and tested the new book before it was finished.

Results: In the evaluation volunteers and kindergarten teachers claimed to be highly satisfied with the initiative overall. However, a few pointed out that some materials could be improved or updated to better support the volunteers in communicating sun safe practices in the best way. The following involving process with volunteers and kindergarten teachers resulted in new and optimized materials as well as strengthened ownership in the initiative ‘The local sun week’.

Conclusions: Evaluating longstanding volunteer projects can make a good initiative great. Learning from and involving the experts, – the volunteers as well as the target group - can optimize materials and secure the best communication in the meeting between volunteers and target group.

Keywords: Volunteers, Local prevention, Materials, Children.

Learning Objectives:
1. Using evaluations in improving sun safety communication.
2. Involving volunteers in improving materials.
3. Involving target groups in improving materials.
4. Communicating sun safety to children

Poster Session 3

Poster #302

Support for Sun Protection Policies in the Netherlands Among Parents of Primary School Children - Karlijn Thoonen1, Liesbeth V. Osch1, Kim Kruijt2, Bart de Wolf2, Hein D. Vries1, Francine Schneider1

Affiliations: 1 Maastricht University, Maastricht, Netherlands – 2 Dutch Cancer Society, Amsterdam, Netherlands

Introduction: The development of effective policy measures to decrease sun exposure and sunburns is imperative for the primary prevention of skin cancer. Policies regarding prohibition of tanning beds, sun protection policies at primary schools and environmental changes at outdoor places are examples of policies that can stimulate the reduction of sunburns. As support for such policies increases the chance of compliance with-and effectiveness of these policies, it is important to gain more insight in the current level of support for sun protection policies.

Methods: A longitudinal study with four measurements (from 2016 – 2019) was conducted among Dutch parents (n=1053) of children aged 4 to 12 years. Online questionnaires were used to measure parental sun protective behaviors, socio-cognitive determinants of
these behaviors and support for policies, consisting of perceived effectiveness and importance of self and others concerning these policies. Demographic group comparisons were conducted with use of ANOVA and linear regression was used to predict support.

Results: Almost 36% of the parents indicated that sun protection policies were present in their child’s school, with 32.5% of parents report shadowed breaks and 28.4% reported application of sunscreen at schools. Results indicated that parents perceive sun protection policies as important themselves, but also think that others share this opinion (respectively M=4; SD=.71; M=3.9; SD=.72). Moreover, parents perceived the policies as moderately effective (M=3.6; SD=.76). Finally, parents own perceptions of effectiveness and importance were negatively associated with age of the child whereas the perceptions of support of others concerning policies was negatively associated with educational level of the parent.

Discussion: This study gained preliminary insight in support parents tend to have for different types of sun protection policies. Furthermore, elaborated data is currently being collected and will be available at the beginning of 2018.

Learning Objectives:
1. To gain insight in the presence and availability of sun protection policies in primary schools and environmental areas in the Netherlands.
2. To gain insight in the extent to which support for sun protection policies is present among parents of primary school children.
3. To be able to decide which factors can possibly increase support among parents for sun protection policies for the use of advocating.

Poster #304
SUNucate: Helping Children Gain Access to Sun Protection - Kristin A. Hellquist

Affiliations: American Society for Dermatologic Surgery Association, Rolling Meadows, IL, USA

ASDSA developed a model bill, aimed at the US states, to enable school-aged children to gain access to sunscreen and sun-protective clothing at school, camp and daycare. Especially related to sunscreen, school districts (local units of government in the US) often prohibited or required a doctor’s note to allow kids access to sunscreen or ability to apply, due to FDA regulations as an over the counter drug in the US. Realizing kids spend time outdoors at school in gym, recess, sports, field days, etc. our member dermatologic surgeons wanted to help curb this barrier and bring awareness to the issues surrounding sun protection and prevention of skin cancer. The model also addresses allowing for the wearing of sunprotective clothing and optional provisions to educate kids about sun protection and skin cancer dangers. Modeled after pieces of existing state law in CA, TX and OR, SUNucate really took off during the 2017 legislative session with 8 states passing variations of the model bill, 5 more have active legislation and at least another 5 looking to pass the law in 2018.

Learning Objectives:
1. Identify legislative and regulatory barriers in the US for kids to access sun protection.
2. Identify the top areas of policymaker concern for NOT passing this model policy.
3. Identify proven communication methods to help stakeholders and policymakers craft optimal policy to protect kids from the dangers of the sun and educate them for the future.

Poster #305
Overcoming Barriers, Finding Enablers, Improving Sun Protection Practice in Primary Schools - Elizabeth King

Affiliations: Cancer Council NSW, Sydney, NSW, Australia

Introduction: SunSmart is Cancer Council NSW’s (CCNSW) flagship skin cancer prevention program in early childhood and primary school settings. SunSmart supports the implementation of sun protection policies and practices, to reduce children’s overexposure to ultraviolet radiation.

Evaluation via periodic national surveys demonstrates the significant progress SunSmart has made in assisting schools in improving sun protection. Self-report survey results of NSW primary school children’s sun safe wearing practices (80%) do not reflect observational data (60%), highlighting the need for more targeted strategies to support schools.

A two year policy to practice intervention will develop
tailored strategies and resources to foster a whole of school approach to support the implementation of sun safe hat wearing by students.

Methods: Qualitative research will be undertaken with pilot schools to identify barriers and enablers to current hat wearing practices and guide the development of tailored strategies and resources. Observations of students at baseline and post-intervention will be used to obtain an objective measure of hat wearing behavior.

- Tailored support will be provided to guide action plan development and implementation across pilot schools
- Qualitative interviews across the intervention will be used to inform process evaluation results.

Results: Qualitative findings will be presented. All final results will be available in June 2019.

Conclusions: We are not aware of any other projects that have measured the impact of tailored support tools to increase sun safe practices in schools. By choosing only one of the ten SunSmart recommendations, this pilot will assess the impact of tailored ‘how to’ support tools on school engagement and implementation of sun safe hat wearing.

Learning Objectives:
1. Explain the evolution of the Australian SunSmart model.
2. How to apply strategies and resources to translate policy into practice.
3. Outlining a process of developing resources that meet the needs of the audience.

Poster #307
Trends in the Number of Tanning Salons in Ontario, Canada (2001-2017) - Jennifer E. McWhirter, Spencer Byl, Alyssa Green, Andrew Papadopoulos

Affiliations: University of Guelph, Guelph, ON

Introduction: Ultraviolet (UV) radiation from indoor tanning equipment is a known cause of skin cancer; however, to date, how the quantity of indoor tanning salons in Ontario, Canada has been impacted relative to key public health reports and policies, especially the Skin Cancer Prevention Act (SCPA), has not been assessed.

Methods: Tanning salon listings were obtained from the 2001 to 2017 editions of InfoCanada’s Ontario Business to Business Sales and Marketing directories. Overall trends, and a comparison of the number of tanning salons before and after the enactment of Ontario’s SCPA in 2014, as well as the 2006 International Agency for Research on Cancer (IARC) report summarizing the evidence on indoor tanning and skin cancer and the 2009 World Health Organization (WHO) reclassification of artificial UV radiation as carcinogenic, were assessed using descriptive statistics and correlation.

Results: The number of tanning salon listings in Ontario increased between 2001 and 2006 and then declined from 2006 to 2017 ($r(15) = -0.820, p<0.01$). There were significantly fewer tanning salon listings in the years after vs. before the 2014 SCPA ($\chi^2 = 60.066, df=1, p<0.01$),
the 2009 WHO reclassification ($\chi^2 = 37.229$, df=1, $p<0.01$), and the 2006 IARC report ($\chi^2 = 4.285$, df =1, $p<0.05$).

Conclusions: The number of tanning salons in Ontario has been declining since 2006, which may reflect a decline in indoor tanning bed use. Key public health policy instruments, including public education and legislation, appear to be associated with this trend, suggesting they may have had a positive influence on deterring indoor tanning.

Learning Objectives:
1. Understand how the number of tanning salons in Ontario has changed over time.
2. Be aware of the potential influence of public health initiatives (reports, legislation) on indoor tanning availability.
3. Understand the limitations of business listing data for assessing tanning salon quantity and indoor tanning bed use.

Poster #308
How Frequency of Sunbed Use are Association with Demographic Factors, Health-Related Behaviours, and Appearance-Related Factors Among Danish Students - Maria K. Meyer, Anne Sofie P. Christensen, Anne F. Krarup

Affiliations: Danish Cancer Society, Copenhagen, Denmark

Introduction: Sunbed use is associated with an increased risk of melanoma and younger people may be more vulnerable to the carcinogenic impact. Since 2008, the Danish Sun Safety Campaign has aimed to reduce sunbed use among younger Danes. Even though sunbed use is now a minority behaviour in Denmark, it is still relevant to get more knowledge about the current sunbed users. A previous study of ours have shown how sunbed use (at least once a year) was associated with certain health-related behaviours and appearance-related factors. The objective of this presentation is to assess how demographic factors, health-related behaviours and appearance-related factors are associated with frequency of sunbed use.

Methods: Cross-sectional data from the Danish National Youth Study collected by the National Institute of Public Health during 2014 are used. A total of 75 000 students answered the questionnaire about sunbed use and 250 other questions regarding health and well-being. The association between frequency of sunbed (never, monthly, weekly/daily) use and the following variables will be investigated: Alcohol consumption, diet, smoking, physical activity level, body satisfaction, dieting, and weight perception (all of which will be dichotomized). Logistic regression will be used.

Results: Our preliminary results indicate that females use sunbeds more frequent than males. Furthermore, it indicates that smokers, people who binge drink more often, people with lower body satisfaction and weight perception, and people who had been dieting the last year had higher frequency of sunbed use. The final results and conclusion will be presented at the conference.

Learning Objectives:
1. How demographic factors are associated with frequency of sunbed use.
2. How health-related behaviours are associated with frequency of sunbed use.
3. Why this knowledge is valuable in future campaigns preventing sunbed use among younger people in Denmark.

Poster #309
A Systematic Review of the Impact of Indoor Tanning Legislation on Youth - Jessica Reimann, Jennifer McWhirter, Andrea Cimino, Andrew Papadopoulos, Cate Dewey

Affiliations: University of Guelph, Guelph, ON

Introduction: Artificial UV radiation exposure can lead to several detrimental health outcomes, including an increased risk of skin cancer. Many countries have implemented indoor tanning legislations to protect youth from the dangers of artificial ultraviolet (UV) exposure. It is important to determine the effect indoor tanning legislations have on the prevalence of indoor tanning amongst youth, as these changes will have the greatest long-term impact on health outcomes. Evidence around the impact of indoor tanning legislations has not yet been synthesized.

Methods: A systematic review was conducted to obtain peer-reviewed literature about the impact of indoor tanning legislation on youth prevalence of indoor tanning. Six databases were searched, resulting in 12,398 citations.
Reference lists from relevant articles were also searched, and additional articles that the database search had not already discovered were found. In total, six studies met the inclusion criteria, and were included in this review.

Results: The impact of indoor tanning legislations varied between studies. Some studies found no association between youth-access indoor tanning legislation and changes in the prevalence of indoor tanning (n=3), while others reported significant reduction in indoor tanning prevalence (n=3). Most studies found numerical decreases in youth indoor tanning prevalence, when comparing prevalence before legislation to after, although only one was statistically significant (range=1%-6% decrease, mean=3%). The prevalence of youth indoor tanning was lower in states with indoor tanning legislation, compared to states without legislation (range=1%-9% lower, mean=4%). Prevalence of youth indoor tanning use never decreased to 0%, which is the goal of indoor tanning legislation. Reasons for variability in legislation impact and compliance will be discussed.

Conclusions: The impacts of indoor tanning legislations varied between studies, and never met the intended effect. Indoor tanning legislation was limited in terms of its impact on the prevalence and frequency of indoor tanning among youth.

Learning Objectives:
1. Identify whether, and the extent to which, indoor tanning legislation has influenced youth indoor tanning behaviour.
2. Identify the prevalence of indoor tanning by youth, and how this varies based on jurisdictional and temporal differences.
3. Understand the reasons for variability in the impact of indoor tanning legislation.
4. Evidence synthesis will provide researchers and policy makers with information on the potential impact and effectiveness of indoor tanning legislation.

Poster #310

Skip the Base Tan: An Evidence-Based Social Marketing Campaign to Reduce Indoor Tanning in Saskatchewan - Nicole Braun

Affiliations: Saskatchewan Cancer Agency, Sun Smart Saskatchewan, Saskatoon, SK

Introduction: Sun Smart Saskatchewan developed a social marketing campaign to address the myth that base tans protect against future sun exposure.

Methods: Sun Smart Saskatchewan worked with a marketing firm to determine the overall strategic direction of the campaign and the target audience (females aged 18-24 who have a propensity for indoor tanning).

The campaign was informed by a Sun Smart Saskatchewan survey that assessed young adults’ knowledge, attitudes, and behaviours regarding indoor tanning. 64.2% of respondents said gaining a protective base tan is a very important or important reason for indoor tanning. The marketing firm developed tentative creative concepts related to base tans and focus tested them with the target audience to determine the designs and messages that were most relevant.

The marketing firm used the results of the focus test to finalize creative assets, including a landing webpage, online banner advertisements, video advertisements, and posters.

The campaign launch coincided with the winter travel season with targeted media placements during November/December 2015 and January/February 2016. Media selection included mostly internet-based advertising channels as the most strategic means to reach the target audience.

Results: The analytics demonstrated strong exposure to the messages and engagement with the campaign. We saw engagement with the campaign advertisements at 4.5 times the industry benchmark. The campaign generated 3,809,895 impressions overall.

Conclusion: An overwhelming 94.8% of indoor tanners surveyed agreed that indoor tanning can cause skin cancer. It’s clear that young adults are using tanning beds despite being aware of the long term health risks, therefore a campaign focused strictly on long term health risks is unlikely to change indoor tanning behaviours. Instead, this campaign was focused on clarifying a widely held misconception about base tans, thereby removing a primary reason for indoor tanning.

Learning Objectives:
1. Describe young adults’ knowledge, attitudes, and behaviours regarding indoor tanning.
2. Consider and apply local evidence to a marketing campaign.
3. Describe social marketing principles for young adults.
Poster #312
Skin Cancer Projections 2014-45 from Potential Age Limit and Ban for Sunbed Use in the Danish Population - Brian Køster, Maria Meyer, Peter Dalum

Affiliations: The Danish Sun Safety Campaign, Danish Cancer Society, Copenhagen, Denmark

Introduction: Exposure to ultraviolet radiation is the main risk factor for skin cancer. Sunbed use is associated with an increased risk of malignant melanoma (MM) and keratinocyte cancers (SCC and BCC). In 2014, a sunbed legislation was adopted in Denmark, however as opposed to sunbed legislation in other countries it did not include an age limit or other measures to protect young people from the risk of skin cancer. We have modelled future effects of a reduction in sunbed use on melanoma and keratinocyte skin cancer incidences 2014-45, had the legislation included an age limit or a complete ban.

Methods: Malignant Melanoma and keratinocyte skin cancer incidences were modelled in the Prevent program, using population projections, historic cancer incidence, prevalence of sunbed use and relative risk of sunbed on melanoma, basal cell carcinoma and squamous cell carcinoma, respectively. An age limit was assumed to reduce sunbed use with 100% among persons younger than 18, and 50% among persons turning 18 during the intervention. Sensitivity scenarios of time from legislation to effect of legislation, incidence trends and relative risks were applied.

Results: Had an age limit been included in the 2014-sunbed legislation it is estimated to have reduced the number of MM, SCC and BCC cases with 2235, 137 and 2094 respectively during 2014-45. If a ban had been implemented it would have reduced the total number of skin cancer cases with 88512, of which 10634, 19550 and 58328 were MM, SCC and BCC, respectively. For MM the percentage reduction was 1.5% and 7.3%, respectively for an age limit and a complete ban.

Conclusion: Structural interventions are able to reduce a large proportion of skin cancers caused by sunbeds. Continued pressure from the Danish Sun Safety Campaign is crucial to have a revision of the Danish sunbed legislation.

Learning Objectives: The presentation will show:
1. a prediction of the future number of skin cancer cases based on development in the risk factor and demography of the population.
2. huge potential in structural interventions against sunbed use.

Poster #314
Effects of Complex Interventions in Primary Prevention of Skin Cancer - Karolina Beifus

Affiliations: University of Wuppertal, Wuppertal, Germany

Introduction: Preventive interventions are still missing evidence for effectiveness. A prerequisite is the critical dealing of utilised parameter as measures for effectiveness and precisely determined effects. Therefore this research investigates the following questions: What effects can be expected from primary prevention interventions? What are essential and sufficient conditions to ensure adequate UV exposure in primary prevention? Characterized as complex interventions prevention interventions include a variety of circumstances with reciprocal interrelations in the contexts they are embedded in. Therefore, more detailed and comprehensive approaches regarding study designs next to RCTs and similarly controlled designs are needed for an appropriate analysis.

Methods: A novel mixed-method approach is employed to combine quantitative and qualitative methods. Causal conditions for gain or loss of outcomes from prevention interventions are displayed with a systematic literature review and subsequent Qualitative Comparative Analysis (QCA) through equities of each influencing condition and possible combinations.

Results: An ongoing fuzzy set analysis displays the impact of conditions “communication strategy”, “recipients and their background”, “time horizon”, and “intervention setting” regarding the occurrence or absence of the effect “less and careful UV exposure”. Thus, to which degree one condition or a set of conditions contribute to the outcome can be determined.

A QCA, undertaken with dichotomous crisp set analysis, revealed following combinations as sufficient conditions for the gain of “less UV exposure”: “information on the personal risk” and “observation beyond 6 month”, further “educational interventions” and “information on the personal risk”.

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Conclusions: Through further investigations in this current research questions on methods of successful communication strategies, targeted persons, and reasons for missing outcomes will be answered. This is also an indispensable groundwork in order to frame suitable endpoints for effectiveness measures and furthermore cost-effectiveness in primary, secondary, and tertiary prevention of skin cancer.

Learning Objectives:
Primary prevention interventions, qualitative comparative analysis, reasons for gained or missed effects from prevention interventions.