

# Challenges in primary prevention: an overview

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# Outline

- Steps to primary prevention of cancer
- Some key challenges
- Case study
  - skin cancer
- Meeting the challenges

# Steps towards cancer prevention

1. Identify modifiable causal (preventive) agents
2. **Show possible benefit of preventive intervention**
3. **Overcome the barriers to prevention**
  - Cultural, social, lifestyle
  - Political, economic

# Show possible benefit of prevention

## Strategy

Randomised controlled trials

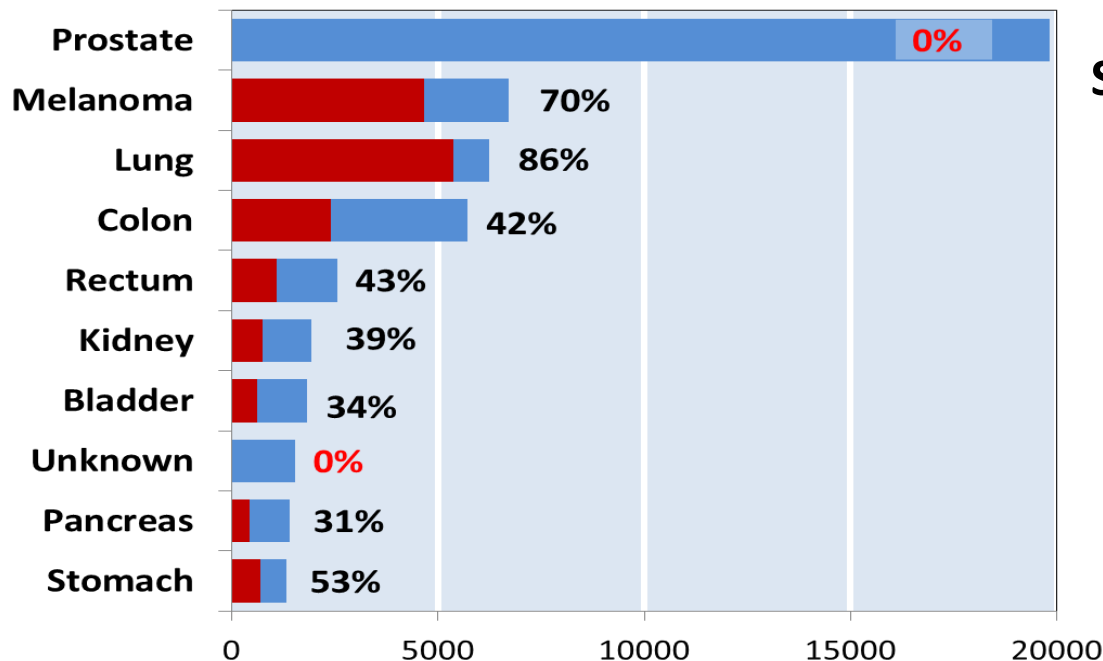
Comparison of cancer rates in exposed and unexposed (PAF)

Model the long-term benefit

## Challenges

- Selected populations
- Cost and time +++
- Randomised intervention unfeasible
- Accurate population exposure
- Agreed risk at levels of exposure
- PAFs are population-specific
- Cost and time +++
- Accurate assumptions
- High quality input data

# Top 10 cancers in Australians (M): % attributable to modifiable factors



## Specific challenges:

- Low quality of exposure data for (Australian) population
- PAF very sensitive to 'causality'; risk estimates
- Uncertain latent period

# Steps towards cancer prevention

1. Identify modifiable causal (preventive) agents
2. Show possible benefit
3. **Overcome the barriers to prevention**
  - Cultural, social, lifestyle
  - Political, economic

# Overcome the barriers

## Cultural, social, lifestyle

- Cultural traditions
- Social forces
- Lifestyle habits

## Region-specific challenges

- NorthEast Thailand: *Raw fish & parasites*  
...**cholangiocarcinoma**
- Papua New Guinea: *Betel-nut*  
...**oral cancer**
- South America: *Hot beverages*  
...**oesophageal cancer**
- Developed world: *Obesity, physical inactivity* ...**multiple cancers**
- World: *Cig smoking, alcohol*  
...**multiple cancers**

# Overcome the barriers

## Political, economic

- **Short-term** profit, expedience
- **The treatment** focus
  - medical care
  - research
- Lack of **cost-effectiveness** data

## Specific challenges

- **Strong & immediate pro-exposure**  
*eg fast food, tobacco, alcohol industries* Vs
- **Delayed effect of preventive action** → **weakens incentives** *for spending, policy*
  - **80%** US health-care \$ spent **treatment**
  - **3%** spent **prevention**  
*(All non-communicable disease)*
- How to price **present** preventive activity Vs **long-term** cancer endpoints?



# Primary prevention of skin cancer: case study



## 3 Steps

- Is there a modifiable cause?
- Can we show benefit?
- What barriers to overcome?

## Causes and challenges

- UV radiation ✓
- Large public health problem?
- Established prevention measures?

# Substantial benefit ✓

## Large public health problem

*eg Australia:*

Number of excisions of BCC, SCC

- Total in 2005 = 446,770
- Total in 2014 = 671,804
  - 50% increase in 10 years
- **294 skin cancers excised per business hour**

## Established prevention measures



Protect yourself in five ways from skin cancer

Source: <http://medicarestatistics.humanservices.gov.au/statistics>

# Primary prevention of skin cancer: case study



## 3 Steps

- Modifiable cause?
- Substantial likely benefit?
- Barriers to overcome?

## Causes and challenges

- UV radiation
- Large public health problem
- Established prevention measures
- Cultural, social, lifestyle?
- Political, economic?
  - Treatment \$ over prevention \$?

# The Tanning Culture





# The Tanning Industry

A Tan (Regardless of Where you Get it)  
is Protective and Natural

A woman with dark hair, wearing a bright pink bikini, is lying on her back on a tanning bed. She is smiling and looking towards the camera. The tanning bed has blue horizontal slats visible in the background. The overall image is a promotional graphic for a presentation about the tanning industry.

book, "Panic Nation: Unpicking the Myths We're Told about Food and Health." Shuster spends pages and chapters explaining why a tan is so important.

"Not all of the sun's benefits are uncertain, particularly the protective effect of a suntan. Since there is some epidemiological evidence to suggest that sunburn in children may be more harmful later in life, parents have been told that sun exposure must be

# Cost of Treatment of skin cancer:

## Eg Expenditure in Australia in 2015

### BCC, SCC: diagnosis, treatment

- \$511 million in 2010
- Estimated to increase to **\$703 million in 2015**

### Treatment advanced melanoma: eg

- Ipilimumab: \$84 million
- **Dabrafenib: \$47 million**  
**(\$131 million in 2015)**

Source:

<http://medicarestatistics.humanservices.gov.au/statistics>

# Investment in Prevention of skin cancer

Australia	Funding	International	Funding
<b>Australian Government 2006-07</b> National Skin Cancer Awareness Campaign (= 3 months tx for advanced melanoma)	<b>\$10 m pa for 2 yrs</b>	New Zealand Cancer Society 2007/2008 multi component, multi-media campaign	NZ\$2 m
VicHealth on SunSmart over 25 years VicGovt 2013-15	<b>\$1 m pa</b>	Danish Cancer Society 2007+ SunSmart	€2.5 m
NSW & Qld 1998-2006 SunSmart	<b>\$0.08 pp</b>	UK Health Education Authority 1999-2000 'Sun Know How'	£0.5 m
WA over long term	<b>\$0.90 pp</b>	UK Health 2003-2010 on SunSmart	£2.5 m
<b>Cancer Australia 2014</b> shade creation, <i>EFTPOS Giveback</i>	<b>\$1 m</b>	USA Skin Cancer Foundation 2014 public awareness/education	US\$6.5 m

# Investment in Prevention of skin cancer

Australia	Funding	International	Funding
Australian Government 2006-07 National Skin Cancer Awareness Campaign (= 3 months tx for advanced melanoma)	\$21 m	New Zealand Cancer Society 2007/2008 multi component, multi-media campaign	NZ\$2 m
VicHealth on SunSmart over 25 years VicGovt 2013-15	\$16 m \$14 m	Danish Cancer Society 2007+ SunSmart	€2.5 m
CINSW 2007-2011 Dark Side Tanning & Wes Bonney campaigns	\$15.6 m	UK Health Education Authority 1999-2000 'Sun Know How' UK Health 2003-2010 on SunSmart	£0.5 m £2.5 m
NSW & Qld 1998-2006 SunSmart WA over long term	\$0.08 pp \$0.90 pp	USA Skin Cancer Foundation 2014 public awareness/education	US\$6.5 m



# Meeting the challenges of primary prevention

- Better identification of causal agents
- Better demonstration of benefit
- Overcome barriers more effectively
- **Collaboration:** epidemiologists + molecular biologists/ epigeneticists
- **Prevention research in community settings**
  - Population-based data on exposure and risk, interventions, large cohort studies
- **Engage** behavioural scientists, economists
- **Mass-media campaigns** for behaviour change
- **Increase payment incentives for clinicians** for cancer-preventive activities

