Skin cancer screening

Lessons from the German experience

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Germany
- 82 million inhabitants

Schleswig Holstein
- Northern federal state
- 2.8 million inhabitants
Outline

• Skin Cancer in Germany
• The SCS pilot project (2003/4)
• Evidence for SCS
• The national SCS (since mid 2008)
• Understanding the differences between pilot project and national screening
• Conclusions/Lessons
SKIN CANCER IN GERMANY
Trends in melanoma incidence in Germany - an epidemic

![Graph showing trends in melanoma incidence]

- **EASR / 100,000**
- **X-axis**: Years (1970 to 2010)
- **Y-axis**: EASR
- **Legend**:
  - Blue line: Men
  - Red line: Women

Skin Cancer Screening - Katalinic
Cancer in Germany

Most frequent tumour sites as a percentage of all new cancer cases in Germany 2010 (not including non-melanoma skin cancer)

- **Prostate**: 26.1%
- **Lung**: 13.9%
- **Colon and rectum**: 13.4%
- **Bladder**: 4.5%
- **Malignant melanoma of the skin**: 3.8%
- **Oral cavity and pharynx**: 3.7%
- **Stomach**: 3.6%
- **Non-Hodgkin lymphomas**: 3.4%
- **Liver**: 2.3%
- **Oesophagus**: 1.9%
- **Central nervous system**: 1.5%
- **Testis**: 1.5%
- **Multiple myeloma**: 0.0%

- **Breast**: 31.3%
- **Colon and rectum**: 7.6%
- **Lung**: 5.1%
- **Uterus**: 4.3%
- **Malignant melanoma of the skin**: 3.6%
- **Pancreas**: 3.5%
- **Ovaries**: 3.5%
- **Leukaemias**: 2.9%
- **Kidney**: 2.6%
- **Leukaemias**: 2.5%
- **Cervix**: 2.1%
- **Thyroid gland**: 1.9%
- **Bladder**: 1.8%
- **Oral cavity and pharynx**: 1.5%
- **Vulva**: 1.5%

20,000 new invasive melanomas per year
THE SCS PILOT PROJECT (SCREEN)
History of skin cancer prevention / early detection in Germany

- 1976  First national early detection guideline (symptomatic skin cancer)
- 1987  ADP – Association of dermatologic prevention
- Since 1989  Campaigns for UV protection and early detection
- 1998-2002  Development of a skin cancer screening (SCS) in Schleswig-Holstein, Germany
- 2003/4  One year SCS pilot project in Schleswig-Holstein (SCREEN project)
- Mid 2008  Nationwide skin cancer screening in Germany
Professor Dr. Eckhard Breitbart

- Dermatologist (Buxtehude)
- Chairman of the ADP (Association of dermatologic prevention)
- Inventor and father of the German Skin Cancer Screening
The SCREEN project

- Development since 1998 with pre-tests of skin exams
- Focused on melanoma, basal cell carcinoma, and squamous cell carcinoma
- Eligible population (≈1.88 million)
  - Members of statutory health insurance
  - 20 years or older

*including gynecologists, urologists, surgeons, internists
The skin cancer screening test

- Whole-body examination
- Physician
- Undressed person
- From scalp to toes
- 10 minutes
- Documentation
- Actually 25€ (paid by health insurance)
The screening model (two-steps)

Screening population

Step 1
- General practitioner
- Suspicious lesion or at risk for SC
- Dermatologist
- Excision
- Therapy

Step 2
- Dermatologist
- Excision
- Therapy
The Screener in SCREEN

- Dermatologists (116 out of 118)
- “General practitioners” (1673 out of 2614) (including gynecologists, urologists, surgeons, internists)
- Precondition: 8 hours training course
Attending mass media campaigns – SCREEN

This can be cured if you don’t close your eyes.

Additionally:
- radio spots
- newspaper
- leaflets
SCREEN results

360,000 participants

280,000 primary exams (73%) GP

47,000 secondary exams (17%) dermatologist

82,000 primary exams dermatologist

16,000 excisions (4.4%)

3,103 skin cancers (0.83%)

Suspicious lesion or at risk for SC
Population-based one-year SCREEN participation

![Bar chart showing population-based one-year SCREEN participation by age group and gender.](chart)

- **Men (10.4%)**
- **Women (27.2%)**

**Participation rate:**

- **1Y: 19.1%**
- **2Y: 38.2%**
## SCREEN – tumor findings

<table>
<thead>
<tr>
<th>Tumor findings (in 2911 persons)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melanoma*</td>
<td>585</td>
<td>20.1</td>
</tr>
<tr>
<td>BCC</td>
<td>1,961</td>
<td>67.4</td>
</tr>
<tr>
<td>SCC</td>
<td>392</td>
<td>13.5</td>
</tr>
<tr>
<td>Other</td>
<td>165</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,103</strong></td>
<td><strong>100.0</strong></td>
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* including in situ (30%)
# SCREEN - Yields

360,000 screenees, 15,983 excisions (1/23 screenees)

<table>
<thead>
<tr>
<th>Confirmed skin cancers</th>
<th>Yield-S [1 SC per x screenees]</th>
<th>Yield-E [1 SC per x excisions]</th>
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<td>2,911*</td>
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* 3,103 tumors

Melanoma Incidence

![Graph showing melanoma incidence](image)

Breitbart et al. 2011 JAAD 66:201-11
Melanoma mortality – first analysis

Breitbart et al. 2011 JAAD 66:201-11
Publications in progress

- 5-year follow up of the SCREEN cohort
  Observed vs. expected melanoma mortality OR 0.6

- Interval cancers after negative screen (24 months)
  invasive cancers OR 0.7

- Risk factors and melanoma detection OR 18

- Systematic review
## Impact of SCS/Skin on Melanoma Incidence and Mortality

### Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>No. of publications</th>
<th>Direction of effect</th>
<th>Absolute change per 100,000/year</th>
<th>Range</th>
<th>Percentage change</th>
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<tr>
<td><strong>Incidence</strong></td>
<td>8 registry studies, 1 cohort study</td>
<td>In situ: ↑</td>
<td>+1.6 to +24.1</td>
<td>+36% to +133%</td>
<td></td>
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<td></td>
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<td>Invasive: ↑↓</td>
<td>-3.1 to +8.9</td>
<td>-17% to +53%</td>
<td></td>
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<tr>
<td><strong>Stage-specific incidence</strong></td>
<td>2 registry studies, 1 cohort study, 1 case-control study</td>
<td>Thin: ↑</td>
<td>+0.3 to +9.0</td>
<td>+3% to +73%</td>
<td></td>
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<td></td>
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<td>Thick: ↓</td>
<td>-9.8 to +0.2</td>
<td>-100% to +18%</td>
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<td><strong>Mortality</strong></td>
<td>3 registry studies, 1 cohort study</td>
<td>↓</td>
<td>-0.9 to -0.7</td>
<td>-50% to -47%</td>
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Interim conclusion

• There is evidence that SCS is effective (weak)

• SCS in SCREEN has to be classified as a complex intervention

  (examination, awareness, education,...)
National Skin Cancer Screening

- Mid 2008
- Two-step screening (GP/dermatologist with whole-body examination)
- Referral in case of suspicious finding
- Screening interval: two years
- Eligible population: 35 years and older (about 45 million)
- Financed by health care system
- No invitation system

- Estimated participation since 2008: 30% of the population
Malignant melanoma incidence and mortality in Germany and Schleswig-Holstein, male and female combined, rate standardized for age according to the European standard per 100,000, logarithmic representation, mortality shown as moving average.

Data sources:
- mortality: www.gbe-bund.de
- incidence for Germany (G): www.gekid.de
National skin cancer screening

• Disappointing results at first sight

• Closer look reveals crucial differences between the national SCS and SCREEN
## Understanding differences between national skin cancer screening and pilot project

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Understanding differences between national skin cancer screening and pilot project

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**SCREEN pilot project**

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Interim conclusion on the national SCS

- Substantial differences between national SCS and pilot project
- National SCS is much less “intensive”
- It is likely that fewer risk persons attended
- The mere introduction of a screening examination seems to be insufficient
- Insofar the rising melanoma mortality in the pilot region and the stable mortality in the rest of Germany are almost not surprising
Conclusions and lessons learnt from the German SCS

• SCS can be effective, there is limited but sufficient evidence.

• It is unclear which part of the complex intervention in the pilot region is the most relevant. Most likely the interaction of awareness, training and screening examination is the key.

• The mere introduction of a screening examination seems to be insufficient.

• There are promising results that a risk-adaptation of SCS could improve performance.

• Whatever we do, an evaluation strategy is needed in advance to show that we are causing more benefit than harm!
Views of the Hanse City Lübeck