Total-Body Examination vs Lesion-Directed Skin Cancer Screening

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IMPORANCE: Skin cancer is the most frequent cancer type. It remains unknown if and how screening programs can be organized in a cost-effective manner.

OBJECTIVE: To compare the 2 screening strategies of systematic total-body examination (TBE) and lesion-directed screening (LDS), with a focus on the participation rate, detection rate, anxiety, and cost.

DESIGN, SETTING, AND PARTICIPANTS: Population-based cross-sectional screenings by a team of 6 dermatologists were organized in 2 sociodemographically similar regions. The TBE was organized in a community of 9325 inhabitants 18 years and older (Wichelen, East Flanders, Belgium) during a 5-day screening (March 14-18, 2014). The LDS was organized in a sociodemographically comparable community (Nevele, East Flanders, Belgium) of 9484 adult inhabitants during a 4-day screening (April 22 and 25-27, 2014). The first population received a personal invitation for a standard TBE. In the second population, individuals were invited for an LDS if they had a lesion meeting 1 or more of the following criteria: ABCD rule (A, asymmetry; B, borders; C, colors; and D, differential structures), ugly duckling sign, new lesion lasting longer than 4 weeks, or red nonhealing lesions.

MAIN OUTCOMES AND MEASURES: In total, 1982 individuals were screened, and 47 skin cancers (2.4%) were histologically confirmed, including 9 melanomas (0.5%), 37 basal cell carcinomas (1.9%), and 1 squamous cell carcinoma or Bowen disease (0.1%).

RESULTS: The positive predictive value for all suspicious lesions was 56.6% (47 of 83). The participation rate was 17.9% (1668 of 9325) in the TBE group vs 3.3% (314 of 9484) in the LDS group (P < .01). The skin cancer detection rate per 100 participants did not differ significantly between the 2 groups, with rates of 2.3% (39 of 1668) in the TBE group vs 2.2% (8 of 248) in the LDS group (P = .40). The operational effectiveness per 100 invitees was 0.4% (39 of 9325) in the TBE group vs 0.1% (8 of 9484) in the LDS group (P < .01). In addition, LDS was 5.6 times less time consuming than TBE. Participants in the LDS group had significantly higher baseline anxiety levels compared with participants in the TBE group (3.7 vs 3.3 points on a visual analog scale, P < .01). In screenees without a suspicious lesion, anxiety levels significantly dropped after screening.

CONCLUSIONS AND RELEVANCE: Total-body examination yielded a higher absolute number of skin cancers. Lesion-directed screening had a similar detection rate of 3.2% (8 of 248) but was 5.6 times less time consuming. When performed by dermatologists, LDS is an acceptable alternative screening method in health care systems with limited budgets or long waiting lists.

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The incidence of melanoma and nonmelanoma skin cancer (NMSC) has been rising dramatically worldwide, and this increase is expected to continue with aging of the population. The cumulative lifetime risk of developing basal cell carcinoma (BCC) in the Netherlands is estimated to range from 1 in 5 to 1 in 6 persons. In the United Kingdom, the lifetime risk of developing malignant melanoma is 1 in 55 for men and 1 in 56 for women. Early detection is believed to result in better cure rates and subsequently more cost-effective treatment. Because skin examination is a simple, noninvasive technique, several early detection initiatives exist, most of which focus on melanoma only. However, most skin cancers are NMSC, and these neoplasms represent the greatest direct cost to public health. Population-based screening by means of total-body examination (TBE) in asymptomatic persons has not been proven cost-effective, although experience in Germany suggests that such screening is feasible and can reduce skin cancer burden. Most screening initiatives focus on specific high-risk groups, missing many skin cancers that occur outside of this high-risk setting. A reliable and acceptable test is an important tool in skin cancer screening. Dermoscopy has been shown to increase diagnostic accuracy for melanoma over naked-eye examination in experienced users. 

Because evidence for the cost-effectiveness of skin cancer screening by TBE is lacking, we aimed to test a lesion-directed screening (LDS) approach. With this method, screenees are seen with only a specific lesion of concern meeting certain preset criteria. We hypothesized that LDS would increase the priori probability of skin cancer detection and be time saving for the physician.

In a pilot study evaluating LDS in 199 persons, 25 suspicious lesions (12.6%) were detected, and individuals were referred to their general practitioner (GP) or to a dermatologist for further care. When only BCC (which can be diagnosed clinically) and 2 histologically confirmed melanomas were included, the pilot study had a detection rate of at least 8.5%. This percentage is 10-fold higher than the detection rate of a systematic skin cancer screening program in the German state of Schleswig-Holstein, in which skin cancers were detected in 0.8% of the population, including 0.5% BCCs, 0.1% squamous cell carcinomas (SCCs), and 0.2% melanomas. Based on estimated incidence rates in Belgium, the expected skin cancer yield would be less than 0.2% of the population. Therefore, screening individuals for selected lesions meeting predefined criteria could give a higher yield of relevant lesions than promoting systematic whole-body screening. This concept is new in skin cancer screening. Based on these data, we decided to perform a comparative effectiveness study.

We compared dermatologist-conducted LDS with standard TBE screening in 2 sociodemographically similar regions, with a focus on the participation rate, detection rate, anxiety level, and cost. Because screening may cause anxiety and depression, a visual analog scale (VAS) to measure anxiety levels was included in the protocol. Such a scale is an accepted tool used in dental practice and in the measurement of perioperative anxiety. The VAS corresponds well with the Spielberger State-Trait Anxiety Inventory, a validated test quantifying anxiety.

Methods

Patients and Screening

Population-based cross-sectional skin cancer screenings were performed without randomization. The TBE was organized in a community of 9325 inhabitants (Wichelen, East Flanders, Belgium) during a 5-day screening (March 14-18, 2014). All inhabitants 18 years and older received a personal invitation 5 weeks in advance for a free-of-charge TBE, including a message that skin cancer incidence is an increasing health care problem.

The LDS was organized in a comparable community in terms of genetic background, socioeconomic status, culture, and geographic area (Nevele, East Flanders, Belgium) during a 4-day screening (April 22 and 25-27, 2014). The 9484 inhabitants were also invited by a personal letter 5 weeks in advance for a free-of-charge skin cancer check if they had a lesion meeting 1 or more of the following listed criteria: ABCD rule (A, asymmetry; B, borders; C, colors; and D, differential structures), ugly duckling sign, new lesion lasting longer than 4 weeks, or red nonhealing lesions. A TBE was offered to all LDS participants at the end of the lesion screening.

Individuals were asked to preregister to obtain an estimate of the number of participants and to organize the screening team. All aspects of the sensitization campaign and registration process were similar in the 2 groups. Only the specific message to the populations differed.

The screenings were organized in a public place of the municipality. All participants were randomized to 1 of 6 dermatologists (including K.V., B.B., S.D.S., K.O., or L.B.) with similar expertise in skin cancer and dermatoscopy. The screening was performed using both naked-eye inspection and dermoscopy. In the case of a suspicious lesion, a second opinion was obtained to reduce interobserver variability. Suspicious lesions were photographed, and the patient received a referral letter for his or her GP or a dermatologist.

The study was approved by the Flemish government and by the medical ethics committee of the University Hospital Ghent, Ghent, Belgium. All participants provided written informed consent.

Data Collection

Participants were interviewed using a standard questionnaire to collect information on demographics and risk factors. Anxiety about skin cancer was evaluated using a VAS ranging from 0 (no fear) to 10 (highest possible fear) before and immediately after screening, irrespective of the outcome.

During the clinical examination, the following features were recorded: skin type according to Fitzpatrick, solar lentigines, actinic keratosis, the number of nevi, and the presence of atypical nevi. All melanocytic lesions on exposed skin (except genitalia) were counted, and atypical melanocytic nevi were defined as previously described by Garbe et al. The duration of the clinical examination was noted. This period was defined as the time needed for the patient to get fully undressed (for TBE) or to show the specific lesion (for LDS), plus the time needed for the dermatologist to examine the body (for TBE) or the lesion (for LDS) via naked eye and dermatoscopy.
When a suspicious lesion was detected during one of the screenings, the patient was referred to his or her GP or to a dermatologist for biopsy or excision and treatment. The clinical suspicion rate was defined as the number of referrals divided by the number of participants. The pathological outcome of the lesion was retrieved and considered the final diagnosis and yield.

**Outcomes**

Four primary outcomes were evaluated. First was the participation rate, defined as the total number of participants divided by the total number of invited inhabitants. Second was the detection rate, defined as the number of histologically confirmed skin cancers among the total number of participants, as well as the operational effectiveness, defined as the overall yield in the invited population. Third, the effect of the screening on anxiety was evaluated by comparing the VAS scores before and after screening. Fourth, the cost, expressed as the direct cost per detected lesion, was calculated for the 2 screening methods. For calculation of the cost, the measurement and valuation were consistent with the perspective of the Belgian health care budget and in accordance with the 2014 National Institute for Health reimbursement guidelines in Belgium. For these costs of the screening program, subsequent treatment and indirect costs were not taken into account. In addition, the time spent per screening was assessed to better understand the screening capacity of both methods. Mortality was not included as an end point.

**Statistical Analysis**

All categorical variables were compared using Pearson χ² test or Fisher exact test if the conditions for Pearson χ² test were not met. Independent-sample or paired-sample t test was used for continuous variables. Differences are expressed with 95% CIs. All statistical tests were 2 tailed, and P < .05 was considered statistically significant. The analyses were conducted using statistical software (SPSS, version 21.0; IBM). Sample size calculation of the number of invitees was based on the participation rate and effect size of published data and the pilot study. Power analysis was also conducted using a computer program (SPSS SamplePower, version 3.0; IBM).

**Results**

**Participation**

In total, 1982 individuals were screened in this study. The participation rate was 17.9% (1668 of 9325) in the TBE group vs 3.3% (314 of 9484) in the LDS group (P < .01) (Table I). The sex distribution was comparable, with a modest female predominance of 56.2% (1113 of 1982) overall. There was no difference between groups in the median age. Educational level was higher in the LDS group, with 16.0% (49 of 306) having a university degree compared with 9.9% (163 of 1654) in the TBE group (P < .01).

Regarding their motivation to participate, 77.3% (1280 of 1655) in the TBE group wanted to obtain a total-body skin check, whereas 75.8% (238 of 314) in the LDS group consulted...
for a specific lesion. However, 6.6% (109 of 1655) in the TBE group consulted because of concern about a specific lesion, and 17.8% (56 of 314) in the LDS group had no specific lesion of concern but consulted for a TBE. In total, 90.1% (283 of 314) of screenees in the LDS group agreed to a total-body skin check.

Clinical Findings

The clinical findings are summarized in Table 2. Participants in the 2 groups did not differ significantly regarding Fitzpatrick skin type, total nevus count, and the presence of actinic keratosis or atypical nevi. A positive personal or family history of skin cancer and the number of participants who had received at least 1 previous skin check was similar in both groups at 38.3% (634 of 1655) in the TBE group and 39.2% (123 of 314) in the LDS group.

The clinical suspicion rate was 4.4% (73 of 1668) in the TBE group vs 3.2% (10 of 314) in the LDS group (P = .66). The most frequent clinical diagnosis was BCC. Some screenees had more than 1 clinically suspicious lesion, especially multiple BCCs (1 individual each had 3, 9, and 10 lesions, while 6 individuals had 2 lesions) and Bowen disease lesions (1 individual had 3 lesions, while 3 individuals had 2 lesions).

Skin Cancer Detection Rate

The histological diagnoses of 1 participant in the LDS group and 12 participants in the TBE group could not be retrieved. In the LDS group, a lesion suspicious for Bowen disease had resolved spontaneously when the participant came to the dermatology office for biopsy. In the TBE group, 1 participant died before referral, 4 participants chose not to have an excision or biopsy, and 7 participants postponed excision or biopsy because of other health problems.

In total, 1982 individuals were screened, and 47 skin cancers (2.4%) were histologically confirmed. No suspicious lesions were found in screenees younger than 35 years, and the skin cancer detection rate in the age group 35 years and older was 3.0% (47 of 1548). Melanoma was detected in 0.5% (9 of 47), 1.9% (37 of 47) had confirmed BCC, and 0.1% (1 of 47) manifested SCC or Bowen disease. The positive predictive value (PPV) for melanoma was 50.0% (95% CI, 0.24-0.76), while the PPV for BCC was 72.3% (95% CI, 0.58-0.83) (Table 3). The PPV for SCC or Bowen disease was only 12.5% (95% CI, 0.01-0.49). The overall PPV for skin cancer was 56.6% (95% CI, 0.46-0.67).

Skin cancer detection rates between the 2 screening methods did not differ significantly at 2.3% (39 of 1668) for TBE vs 3.2% (8 of 248) for LDS (P = .40). However, in the population invited for TBE, significantly more skin cancers were detected given the higher participation rate of 0.4% (39 of 9325) for TBE vs 0.1% (8 of 9484) for LDS (P < .01) (Table 4).

In total, 283 of 314 participants in the LDS group (90.1%) agreed to have a total-body skin check. Among individuals in whom the initial index lesion was not suspicious, only one skin cancer at another site was detected. In a subgroup of 10 participants in whom the presented lesion was suspicious, additional malignant lesions were revealed by total-body skin check.
in 3 persons (confirmed BCC in 2 and confirmed Bowen disease in 1). Among 66 participants in the LDS group who did not consult for a specific lesion, only one skin cancer (a confirmed BCC) was detected in her total-body check.

**Anxiety**

Participants in the LDS group had significantly higher baseline anxiety scores (3.7 points) compared with the TBE group (3.3 points) as measured by the VAS (P < .01) (Table 5). Among individuals in whom no suspicious lesion was detected by screening, a similar reduction in anxiety level of 1.3 points on the VAS was observed in both groups (P < .01). In screenees who were diagnosed as having a suspicious lesion, a small rise in the level of anxiety of 0.3 points was seen, but this change was not statistically significant.

**Time and Cost**

The mean (SD) duration of the complete skin cancer examination was 232.0 (70.1) seconds in the TBE compared with 40.9 (67.1) seconds in the LDS (P < .01) group. Therefore, LDS was 5.6 times less time consuming than TBE. Analysis of the time needed to perform only the clinical examination, without considering the time to undress, revealed similar mean (SD) results of 171.6 (62.7) seconds for TBE and 24.2 (31.8) seconds for LDS.

Reimbursement for the clinical examination, excision, and pathological analysis was in accordance with the 2014 National Institute for Health reimbursement guidelines in Belgium. The total estimated costs of screening per detected skin cancer were €931 (US $1008) for LDS and €1012 (US $1096) for TBE. In future work, a Markov model will be designed to de-

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**Table 3. Histological Findings**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No./Total No. (%)</th>
<th>TBE (n = 1668)</th>
<th>LDS (n = 248)</th>
<th>P Valueb</th>
<th>TBE Minus LDS, % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin cancer detection rate</td>
<td>47 (2.4)</td>
<td>39 (2.3)</td>
<td>8 (3.2)</td>
<td>.40</td>
<td>−0.89 (−3.96 to 0.90)</td>
</tr>
<tr>
<td>Melanoma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detection rate</td>
<td>9 (0.5)</td>
<td>8 (0.5)c</td>
<td>1 (0.4)</td>
<td>.87</td>
<td>0.08 (−1.78 to 0.65)</td>
</tr>
<tr>
<td>PPV</td>
<td>5/10 (50.0)</td>
<td>4/9 (44.4)c</td>
<td>1/1 (100)</td>
<td>.99d</td>
<td>NA</td>
</tr>
<tr>
<td>BCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detection rate</td>
<td>37 (1.9)</td>
<td>30 (1.8)d,e</td>
<td>7 (2.8)d</td>
<td>.28</td>
<td>−1.02 (−3.96 to 0.61)</td>
</tr>
<tr>
<td>PPV</td>
<td>34/47 (72.3)</td>
<td>28/40 (70.0)d,e</td>
<td>6/7 (85.7)d</td>
<td>.69</td>
<td>NA</td>
</tr>
<tr>
<td>SCC or Bowen disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detection rate</td>
<td>1 (0.1)</td>
<td>1 (0.1)f</td>
<td>0</td>
<td>.99d</td>
<td>0.06 (−1.47 to 0.34)</td>
</tr>
<tr>
<td>PPV</td>
<td>1/8 (12.5)</td>
<td>1/6 (16.7)f</td>
<td>0/2</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Missing histology reports</td>
<td>13</td>
<td>12</td>
<td>1</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Abbreviations: BCC, basal cell carcinoma; LDS, lesion-directed screening; NA, not applicable; PPV, positive predictive value; SCC, squamous cell carcinoma; TBE, total-body examination.

a In total, 248 participants in the LDS group consulted for a specific lesion. Participants undergoing a standard skin check were not included in the total number.

b Pearson χ² test unless otherwise stated.

c Four melanomas were detected among participants referred for excision of an atypical nevus. Four melanomas were also detected among participants referred for excision of a lesion suspicious for melanoma.

d Fisher exact test was used because the conditions for Pearson χ² test were not met.

e Two BCCs were detected among participants with a lesion suspicious for Bowen disease.

f For calculation of the detection rate and PPV, only the first BCC and Bowen disease lesion were taken in account.

g One BCC was detected in a patient with a lesion suspicious for SCC.

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**Table 4. Skin Cancer Detection Rate and Operational Effectiveness**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (%)</th>
<th>P Valuea</th>
<th>TBE Minus LDS,% (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Cancer Detection Rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBE (n = 1668)</td>
<td></td>
<td></td>
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<td>BCC</td>
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<td>.28</td>
<td>−1.02 (−3.96 to 0.61)</td>
</tr>
<tr>
<td>SCC or Bowen disease</td>
<td>1 (0.1)</td>
<td>.99b</td>
<td>0.06 (−1.47 to 0.34)</td>
</tr>
<tr>
<td>Operational Effectiveness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBE (n = 9325)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin cancer</td>
<td>39 (0.4)</td>
<td>&lt;.01</td>
<td>0.33 (0.19 to 0.49)</td>
</tr>
<tr>
<td>Melanoma</td>
<td>8 (0.1)</td>
<td>.02</td>
<td>0.08 (0.01 to 0.16)</td>
</tr>
<tr>
<td>BCC</td>
<td>30 (0.3)</td>
<td>&lt;.01</td>
<td>0.25 (0.12 to 0.39)</td>
</tr>
<tr>
<td>SCC or Bowen disease</td>
<td>1 (0)</td>
<td>.99b</td>
<td>0.01 (−0.03 to 0.06)</td>
</tr>
</tbody>
</table>

Abbreviations: BCC, basal cell carcinoma; LDS, lesion-directed screening; SCC, squamous cell carcinoma; TBE, total-body examination.

a Pearson χ² test unless otherwise stated.

b Fisher exact test was used because the conditions for Pearson χ² test were not met.
Data from the Euromelanoma campaigns rarely report complete histological follow-up for NMSC. The yield for histologically confirmed melanoma varies among different European countries. In the 2009 and 2010 campaigns, the total detection rate was 0.35% among all participating countries. Only one campaign in Switzerland included NMSC histological findings, resulting in detection rates of 0.38% for BCC and 0.15% for SCC. During the 2009 Euromelanoma campaign in Belgium, 2652 participants were screened, and 12 melanomas were found, resulting in a detection rate of 0.45%, which is similar to our findings. Their PPV for melanoma was 22.2% compared with 50.0% in our study, although dermoscopy was used in 94.4% of their examinations.

Compared with TBE, LDS had a lower operational effectiveness, with TBE detecting 5 times more skin cancers in the population. However, the detection rates were not significantly different between the 2 screening methods (2.3% [39 of 1668] for TBE vs 3.2% [8 of 2480] for LDS, \( P = 0.40 \)). Furthermore, LDS was 5.6 times less time consuming than TBE and resulted in lower costs per detected skin cancer. The operational effectiveness of LDS can be increased if whole-body screening is offered to individuals in whom the initial index lesion was the reason for consultation (odds ratio, 3.8; 95% CI, 2.0-4.8) or if a suspicious lesion was found at the problem area (odds ratio, 6.8; 95% CI, 5.2-9.0). The risk of missing a skin cancer significantly increased when no additional TBE was performed. A large proportion of patients with BCC develop multiple BCCs over time, and some of these patients are seen with synchronous BCCs. In our study, 3 of 10 patients had a second confirmed BCC or Bowen disease after being seen with a confirmed malignant lesion on LDS. Total-body examination seems to be the most complete skin cancer screening that can be offered to a population. However, because of budgetary and medical staff challenges that health care systems face today and that result in waiting lists to see a dermatologist, LDS might be a viable alternative.
The participation rate in the TBE group herein was comparable to the participation rate of 19.1% in the German SCREEN (Skin Cancer Research to Provide Evidence for Effectiveness of Screening in Northern Germany) project.32 The almost 5 times lower participation rate in the LDS group herein can likely be explained by the specific message on the invitation or the stated conditions to participate because all other aspects of the sensitization campaign were similar and because the 2 participating areas were socioeconomically comparable according to official statistics. In the TBE group, 109 of 1655 participants (6.6%) attended the screening because they were worried about 1 or more lesions compared with 238 of 314 participants in the LDS group (75.8%). Therefore, the message on the invitation was correctly interpreted by most individuals in the LDS group, probably resulting in a general lower participation rate. In screening, higher educational levels lead to greater participation. Our data showed a significantly higher educational level in the LDS group, with 49.0% (150 of 306) of participants having a higher education or a university degree compared with 41.7% (689 of 1654) of participants in the TBE group. This finding could be related to the more complex and selective message communicated to the LDS group and deserves attention because lower socioeconomic class is an important risk factor for nonparticipation in health care programs and for more advanced cancers at diagnosis.33,34 Efforts to increase the participation rate in the LDS group by means of sensitization campaigns using television, social media, and extra reminders should be examined to fully exploit the benefits of the LDS method and raise its overall yield. Introduction of a preventive health care pathway managed by GPs could benefit the current socioeconomic discrimination in screening campaigns.

Melanoma is one of the most aggressive of all skin cancers. However, the screening cost per melanoma detected in our study was high, raising the question whether it can be cost-effective to focus only on melanoma. In this study, the screening cost per melanoma detected varied between €4631 (US $5015) and €7449 (US $8067). Nonmelanoma skin cancers represent a higher direct cost in the health care budget. Their early detection can help to reduce this cost because when applied to early-stage disease the treatment options are less costly and more effective.35

To our knowledge, no studies evaluating anxiety in skin cancer screening have been published to date, and this adverse effect is frequently used as an argument against screening. The literature suggests that a high-anxiety state should be defined at 1 SD above the normative mean, or a value exceeding 45 on the State-Trait Anxiety Inventory.36 This definition correlates with a VAS score cutoff of greater than 2 points, with a sensitivity of 76.7% and a specificity of 64.9%.22 Our results show that the mean anxiety level dropped significantly in both groups by 1.2 points after a negative screening result ($\text{P} < .01$). In the case of a positive screening result, anxiety level did not increase significantly. It is possible that anxiety was induced by the personal invitations sent out 5 weeks in advance, resulting in a subsequent return to baseline levels. An anxiety measurement obtained before sending out the invitation would provide a more accurate effect of the intervention. Anxiety level prescreening was 0.4 points higher in the LDS group compared with the TBE group ($\text{P} < .01$). This effect is likely because of the perceived alarming nature of the information regarding skin cancer on the LDS invitation. The anxiety level of 109 participants having a specific lesion of concern in the TBE group was comparable to the prescreening level of anxiety in the LDS group (mean 3.7, $\text{P} = .95$). Therefore, it is not only the specific message on the invitation but also the invitee’s reason for participation that influences an individual’s anxiety about having skin cancer.

Conclusions

In general, this study obtained a high skin cancer detection rate and PPV compared with other screening initiatives. There was also high male participation relative to other screenings. Important factors in establishing skin cancer screening are community-based sensitization campaigns and personal invitations to participate, as well as screening teams with dermatologists experienced in using dermoscopy.

Total-body examination yielded a higher absolute number of skin cancers in the invited population. Lesion-directed screening had a similar detection rate of 3.2% but was 5.6 times less time consuming. When performed by dermatologists, LDS is an acceptable alternative screening method, especially in health care systems with limited budgets or long waiting lists. The effectiveness of skin cancer screening by nondermatologists warrants further study. It is important to increase the participation rate in LDS and thus the absolute number of skin cancers detected, noting any differences in screeners’ educational levels and skin cancer awareness. Among participants herein in whom the initial index lesion was not suspicious, only one skin cancer at another site was detected. This finding suggests that a TBE would primarily be indicated if an individual is seen with a suspicious lesion.
Hospital Ghent, at the time of the study) participated on the screening team.

REFERENCES