Total skin examination during screening for malignant melanoma does not increase the detection rate

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Summary
Total skin examination during public screening for malignant melanoma is often advocated, but the benefit of this approach has not been established properly. We assessed the yield of examination of the entire skin, in addition to examination of intentionally shown skin lesions, in people attending melanoma screening clinics in southern Limburg, the Netherlands, in 1993. Of the 4146 attenders, 2910 (70%) showed a specific skin spot. Additional examination of the entire skin was offered to 1385 people. There were 1221 evaluable cases. Fourteen presumptive diagnoses of malignancies were encountered: seven malignant melanomas, all with low clinical suspicion, and seven basal cell carcinomas. Histology revealed three basal cell carcinomas. No malignant melanomas were confirmed by histology. It is concluded that additional total skin examination during screening for malignant melanoma is not worthwhile, except perhaps for persons presenting lesions that are suspicious of melanoma or dysplastic naevi.

Screening for malignant melanoma aims at timely recognition and, thus, theoretically reduces death from this tumour. Several questions about proper screening methods remain unanswered.¹⁻³ One problem is the value of inspection of the entire skin in patients who intend to show only one specific skin spot. Most authors advocate additional, total, skin examination.¹⁻⁴ Complete skin examination seems to have certain advantages, as most malignant melanomas are found on covered parts of the body. On the other hand, an entire skin examination is time consuming, and may be embarrassing. The aim of this study was to investigate the yield of additional total skin examination in participants of a melanoma screening campaign.

Materials and methods
In June 1993, a number of voluntary melanoma screenings were conducted in southern Limburg, the Netherlands.⁵ Participants were asked to indicate whether they opted for examination of one, or a few, specific skin mark(s), or for a complete skin check. Those who intended to show a specific lesion were offered additional, total skin examination, when time and staffing allowed. All those showing a skin lesion suggestive of malignant melanoma or dysplastic naevus were formally offered a total skin check, according to the study protocol. These patients were excluded from the final analysis of additional total skin examinations.

If a malignancy or premalignancy was suspected, the participant received a letter of referral with the proposed line of management to his/her general practitioner. All positive screenees were followed. Four months after the campaign, treatment particulars and histopathology data were compiled. With regard to the non-responders, follow-up was repeated after 10 months.

When appropriate, the chi-squared statistic was used to test for differences between two samples. When the sample sizes were too small for a chi-squared test, Fisher’s exact probability test was used.

Results
A total of 4146 participants were screened. Of these, 2910 (70%) opted for examination of a specific skin mark, and 1197 (29%) for a complete skin check (39 unknown). Of the 2910 persons who intended to show a specific skin lesion, 1385 (48%) were offered additional total skin examination. Of these, 1356 (98%)
agreed to examination of the entire skin. Of the 1356 screenees who accepted an additional skin check, 135 showed, at first examination, a skin mark clinically suspicious of dysplastic naevus or malignant melanoma. These persons systematically underwent a total skin check, according to the study protocol. Thus, 1221 screenees remained for evaluation.

There were 14 presumptive diagnoses of malignancies, seven of malignant melanomas, with a low clinical suspicion, and seven of basal cell carcinomas (Table 1). Follow-up was complete in 12 instances (86%). One person, with a presumed basal cell carcinoma, did not visit her physician, although she was encouraged to do so twice. One patient, with a presumed basal cell carcinoma, was treated without histology. Histology in the compliant cases revealed three basal cell carcinomas. No biopsy-proved melanomas were encountered.

Of the 49 screenees with presumptive diagnoses of premalignancies seen on additional total skin examination, follow-up was achieved in 45 cases (92%). No malignancies were detected on histology in this group.

The initial examination of lesions about which the attendants were concerned, including cutaneous examination in those who opted initially for a total skin check, yielded substantially more presumptive malignancies and premalignancies than the additional total skin examination (Table 2). Histology revealed 13 malignant melanomas (in 13 persons) and 44 non-melanoma skin cancers (in 42 persons) following initial screening. These findings contrast with no melanomas at all (P = 0.05), and only three basal cell carcinomas (P = 0.007), respectively, detected in the additional, total skin examination group.

### Discussion

Examination of the entire skin is advocated during the annual skin cancer/melanoma screening programmes supported by the American Academy of Dermatology (AAD). The argument is that most malignant melanomas are found on covered skin. During screening clinics in the Netherlands, so far, only lesions specifically presented by the screenees have been evaluated.

Screening activities in the Netherlands attract large numbers of people. Considering the lack of space and manpower, it is impossible to perform a total skin check routinely on screening participants concerned about only a single skin mark.

Little is known about the importance and feasibility of complete cutaneous examination during skin cancer screening clinics. Rigel et al. conducted a free skin cancer screening particularly to survey this issue. Attendees were asked to fully disrobe, and gown for a complete skin examination. A total skin check was accepted by 1385 of 2239 participants (62%). The yields of the complete and partial examinations were 13 and one malignant melanomas, respectively. It is questionable, however, whether this increase in malign-

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### Table 1. Yield of additional complete skin examination (n = 1221)

<table>
<thead>
<tr>
<th>Clinical diagnosis</th>
<th>Number of cases</th>
<th>Histopathological diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant melanoma</td>
<td>7</td>
<td>1 Dysplastic naevus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Common mole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Trauma</td>
</tr>
<tr>
<td>Basal cell carcinoma</td>
<td>7</td>
<td>1 Lentigo simplex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Basal cell carcinoma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Seborrhoeic wart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Naevoellular naevus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Treatment without histology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Incomplete follow up</td>
</tr>
</tbody>
</table>

### Table 2. Numbers of presumptive malignancies and premalignancies detected at primary examination and during additional total skin examination

<table>
<thead>
<tr>
<th>Clinical diagnosis</th>
<th>Initial examination n = 4146</th>
<th>Additional total skin examination n = 1221</th>
<th>Significance (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant melanoma*</td>
<td>69 (1.7%)</td>
<td>7 (0.6%)</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>Basal cell carcinoma</td>
<td>95 (2.3%)</td>
<td>7 (0.6%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Squamous cell carcinoma</td>
<td>6 (0.1%)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Bowen's disease</td>
<td>13 (0.3%)</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Actinic keratosis</td>
<td>63 (1.5%)</td>
<td>3 (0.2%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Dysplastic naevus</td>
<td>319 (7.7%)</td>
<td>40 (3.3%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Congenital naevus</td>
<td>370 (8.9%)</td>
<td>5 (0.4%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Other cancerous and precancerous lesions</td>
<td>3 (0.1%)</td>
<td>1 (0.1%)</td>
<td>NS</td>
</tr>
</tbody>
</table>

* Including lentigo malign.
NS, not significant.
nant melanoma diagnoses in the total skin examination group is related to chance detection. The different findings reported by Rigel et al., compared with the findings reported herein, are probably a result of differences in methodology. Rigel et al. distinguished between exposed (easy-to-see) and covered (hard-to-see) areas. People who consented to undress completely were categorized as having a total skin exam, as opposed to those having a partial examination of sun-exposed skin only. In our campaign, screenees were asked to show specific lesions that bothered them, irrespective of body area. In addition, they were encouraged to have the rest of their body surface examined. The melanoma patients described by Rigel et al. probably opted for examination of covered skin, because they were worried about a skin mark on covered skin.

Lookingbill et al. and Lee et al., reported relatively high yields of incidental malignancies found on complete cutaneous examination of dermatology patients. Nearly all tumours were basal cell carcinomas. It is not clear how many of these patients would have shown their hidden tumours anyway as a secondary complaint, irrespective of the opportunity of a total skin check. It has been established that malignant melanomas are regularly shown in passing during office visits for other ailments.

The chance of diagnosing a cutaneous malignant melanoma during additional, total skin examination appears to be extremely low. Only seven cases of low clinical suspicion were recorded, among 1221 persons examined. None of these cases proved to be a malignant melanoma at follow-up. The initial skin check in our campaign yielded more biopsy-proved malignancies and premalignancies than additional examination of the entire skin. Thirteen malignant melanomas were found, among 4146 screenees. Of these, 12 persons intended to show this specific lesion. Only one malignant melanoma was found in a person who voluntarily opted for total skin examination. In addition, 43 histology-proved basal cell carcinomas, and one case of Bowen's disease, were encountered on initial screening. Of the 1221 persons undergoing additional total skin examination, only three had a biopsy-proved basal cell carcinoma.

In a strict sense, the open access early detection clinics held in southern Limburg were not screening processes. As public education, self-selection and physician examination may be inextricably intertwined, especially in the case of skin cancer and melanoma, we consider such campaigns as a type of focussed and selective screening, focussed on the population at the highest risk, and based on self-selection of persons with a high level of awareness and concern. If, however, non-dermatologist physicians are inadequate at identifying pigmented lesions suspicious of being malignant melanomas, one may assume that persons at a screening are even worse at this. The AAD experience suggests that people at high risk for skin cancer generally are selecting themselves appropriately to be screened. Non-selective screening of adult women in a high-incidence region (Australia) yielded only one malignant melanoma among 7450 participants. Screening exercises for skin cancer and melanoma produce yields that are considerably higher.

Although the available screening test, the dermatologist's eye, is very accurate in distinguishing malignant from benign pigmented lesions, the small numbers of dermatologists in most Western countries preclude regular, large-scale screening programmes. In order to offer a reliable screening opportunity following a public education campaign, it is imperative to narrow the scope of such screening exercises. Many more screenees can be seen if only index lesions are examined, without routine additional complete skin checks. Adhering to this approach, we have been able to examine 150-200 persons per investigator per day.

Our results indicate that additional total skin examination in people showing specific skin spots during screening for malignant melanoma, is not necessary. A possible exception is the group of attendees exhibiting lesions that are suggestive of malignant melanoma or dysplastic naevi. Disrobing, gowning and chaperoning, are time consuming. The investment of physician time can be considerable. More screenees can be seen with limited provider time if only partial skin examinations are performed. This may increase the cost-effectiveness of melanoma screening.

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References