Risk profiling and screening for colorectal cancer
Stegeman, I.
Integrated risk profiling facilitates prevention and early intervention

Stegeman I, Kraaijenhagen RA, Bossuyt PM

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Background

“Better to prevent than to cure.” This is a familiar Dutch saying, but we know that prevention measures do not always achieve the desired effect. Individualized risk profiling is a relatively new form of prevention, one that potentially could close the gap between public health prevention and early diagnosis in individuals. It focuses on an assessment of the individual’s chances of having or developing disease. Adherence to recommendations based on an individualized risk profile is usually better than compliance with general health recommendations. In individualized risk profiling, information acquired in questionnaires (about family history, medical history, medication, signs, symptoms and lifestyle), physical measurements (length, weight, waist circumference, and blood pressure) and laboratory measures (blood, urine, feces) are mapped and an individual risk profile is made. On the basis of these risk profiles one can initiate structured personal prevention measures.

Risk profiling has been studied and implemented in the Netherlands for some time now. The Dutch General Practitioners Association (NHG) studies the prevention consult, which focuses on cardiometabolic risk. The NDDO Institute for Prevention and Early Diagnostics NIPED developed the Prevention Compass, which leads to integrated risk profiling for several aspects of health.

In this review we describe the place of risk profiling from a broader perspective, comparing it with more conventional strategies for prevention and early diagnosis.

Risk profiling

In the past few years several projects have aimed to calculate the risk of having or developing disease. The Framingham study, for example, has served as a base for the development of a risk algorithm for cardiovascular disease. For several types of cancer comparable risk profiles are available, like the Harvard Cancer Risk Index.

Many risk factors are associated with more than one disease. Smoking, overweight and physical inactivity are risk factors for cancer as well as for cardiovascular disease, lung emphysema and diabetes. Integrated risk profiling uses this overlap of risk factors by making a single individual risk profile. This way, preventive measures can decrease chances on more than one disease at the same time.
Risk profiling selects persons at increased risk and guides them, via personal and individualized actions, to effective preventive measures and, if necessary, further diagnostic testing.

The validity of risk algorithms has been an oft-discussed topic in recent years. The legitimization of the use of risk algorithms for measuring the chance on disease relies on the validity of these algorithms.

**Cut off points**

One of the disadvantages of many types of screening is that the absolute chances of having disease are not high, while screening can also have negative effects. In the Netherlands population screening programs for colorectal, breast, and cervix cancer are running, in which in relatively few people with disease or a precursor are detected. Additional workup and treatment are costly and can evoke side effects and discomfort. They can also be burdensome for patients. For this reason additional interventions should only be considered in individuals with an increased risk of disease, which is what risk profiling is all about.

In a way, a comparable logic already applies to the current population screening programs. Here, age is used as a major risk factor, to decide who should be screened or not. Younger and older individuals are not invited because the benefits are considered not to outweigh the harms. Age, though, is not the only risk factor for most diseases. For many conditions more risk factors are known, and these can and probably should be used to consider who should and who should not be screened.

**Benefits and harms of risk profiling**

The actual application of risk profiling still needs evaluation. Despite the promises, studies should be conducted to investigate the actual quality and effectiveness of integrated risk profiling. A possible harmful effect of screening in general is the ‘certificate of health effect’ through which a screening participant is falsely reassured of his health status, after which this participant may start acting less responsibly. Such an effect may also be seen with risk profiling that is based on multiple risk factors: individuals at low risk may be less inclined to adopt or continue a healthy lifestyle. It is hard to achieve health changes in individuals with a moderate risk for disease.

In addition, the exact place of integrated risk profiling in the Dutch health care system is not yet known. While universal prevention can be seen as producing a public health benefit, the costs of which should be covered through collective funding, and targeted
health care measures are seen as a task of healthcare professionals, risk profiling is, at the moment, only used in a limited fashion, mostly in corporate settings, where the costs are covered by the employer.

Integrated risk profiling, with targeted diagnosis, and preventive measures on an individual level, can lower the chances of disease in individuals, but we need additional studies to estimate the actual effectiveness of integrated risk profiling.
References


