



Modelling potential health gains of prevention measures in the elderly population of North Rhine-Westphalia

Mensing M, Mekel OCL, Terschüren C

Background

Health Impact Assessment (HIA) aims at assessing the potential health effects of projects, plans and policies, whether they come from inside or outside the health sector. DYNAMO-HIA supports HIA by modelling relative changes in health outcomes for alternative scenarios, using epidemiological causal evidence. It delivers quantitative data for policy resp. intervention comparison that is often lacking. The DYNAMO-HIA software was developed and tested on EU-level [1] and is now adopted for North Rhine-Westphalia (NRW).



Methods

DYNAMO-HIA requires data input for the population of interest, for risk factors, diseases and their interrelations. In NRW, we considered categorical **BMI data** (normal weight, overweight, obesity, as per WHO definition). We used the Robert Koch-Institute survey "KIGGS" for age 0-17 and the NRW "GEDA" survey for adults [2] and generated prevalence data for every age year 0-95 via linear interpolation and proportional calculation for men and women separately.



Scenarios

In our modelling (starting year 2010), the baseline **reference scenario** (blue) perpetuates the BMI class prevalences at date, the **worse scenario** (red) assumes future worsening of obesity rates, whereas the other 2 scenarios show desirable progressions, by which probability of transition from normal weight to overweight (and from overweight to adiposity) could be reduced by 50% (**red_50**, pink) resp. by 25% (**red_25**, green).

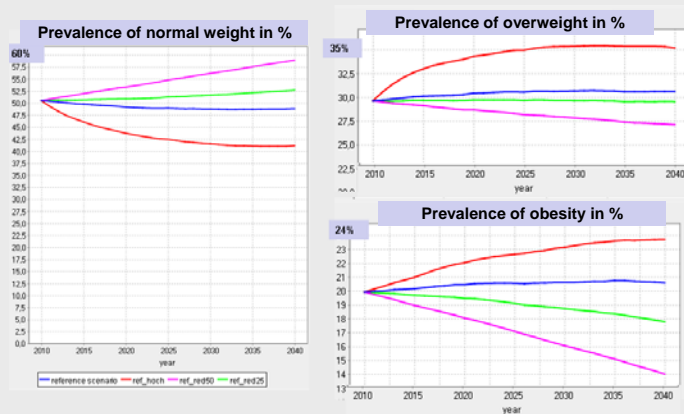


Fig.1 Estimated risk factor prevalence (BMI classes) over time, 2010 - 2040

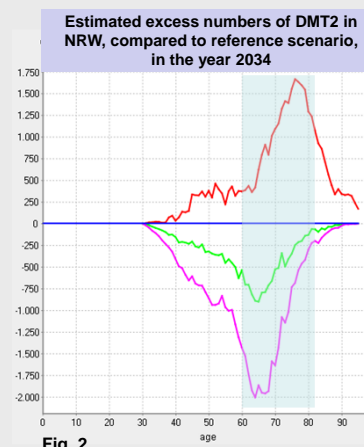


Fig. 2

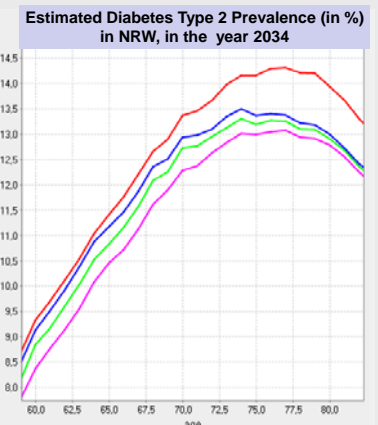


Fig.3

Results

Fig. 1 presents future prevalence rates for BMI classes according to the different scenarios. Obesity is known as a risk factor for different health problems, like Diabetes mellitus Type 2 (DMT2), coronary heart disease (CHD), and some cancers [3, 4]. If the current BMI trend will remain (red scenario), an obesity prevalence of 24% is estimated in 20 years time. This would result in approx. 17,000 excess cases of DMT2 in 2034 in the 60-80-year-old population, compared to the reference scenario (Fig. 2); and this disease's prevalence would rise to an estimated 14% from the age of 72 up (Fig. 3).

If, however, the probability of becoming overweight or obese could be reduced by means of health-promoting living environments or individual behaviour (pink and green scenarios), we estimate approx. 10,000 resp. 25,000 cases that could be prevented in 2034 (Fig. 2). The DMT2 prevalence would only slightly be reduced, compared to the baseline scenario (Fig. 3). The estimated overall mortality in the year 2034 (Fig. 4) could be reduced in the preferable scenarios especially between age 60-70, whereas for higher ages, an increase is estimated in the worse-case scenario.

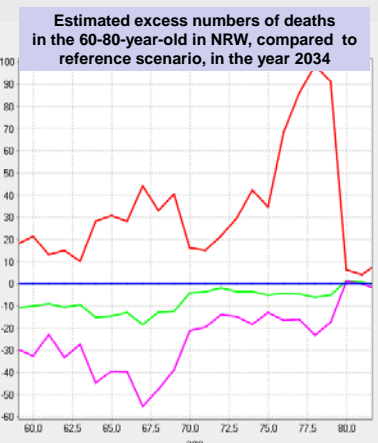


Fig. 4

Conclusions

By modelling future alternative scenarios, we quantitatively estimated health effects of BMI-tackling measures. Reduced probabilities of becoming overweight or obese, by means of health-promoting living environments or individual behaviour, proofed prevention potential for the elderly population in NRW, esp. for Diabetes mellitus Type 2 and overall mortality. Reduction estimates for CHD and cancers, on the other hand, are negligibly small.

References

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Correspondence:
NRW Centre for Health (LZG.NRW)
Westerfeldstr. 35/37
33611 Bielefeld, Germany
Contact: Monika Mensing; Odile Mekel
Tel.: +49 521 8007 3215
Email: monika.mensing@lzg.gc.nrw.de, odile.mekel@lzg.gc.nrw.de
www.lzg.gc.nrw.de