



Policy Brief

Number 2, February 2016

Effective interventions to reduce socioeconomic inequality in health

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Socioeconomic health inequities

Equity is about fairness and justice. Promoting equity is essential if human and social development is to be combined with economically productive societies. Health equity is the absence of systematic differences in health and its determinants between groups of people at different levels of social advantage. The opposite is health inequity, which are avoidable inequalities in health between groups of people that arise from inequalities within and between societies. Such differences are inherently unfair and unjust. Therefore reducing health inequities are essential, and the upward trends for such differences call for further innovative, collaborative actions at all levels.

Socioeconomic disadvantage often translates into a disadvantage in health. Worse health creates high labour productivity losses, unemployment, increased demands for health care and high uptake of social security benefits. Therefore, action is not only about safeguarding human rights, but also has a strong economic rationale.

In order to address human rights and the economic consequences of health inequities, current health strategies need to be strengthened and combined with new strategies, directly tackling social determinants. The potential for both national and regional policies to help improve the population's health need to be maximised. Regional policies are of particular importance for addressing existing differences between and within regions within the EU. Problems should be tackled locally, where they arise.

Mechanisms to address health inequalities

Policies and interventions that have proven to be effective in reducing socioeconomic health

inequalities¹ are still rare. This is partially because evaluating these policies and interventions in a scientifically sound way is very challenging. For example, it may not be practically feasible or ethically reasonable to randomly assign people or groups to a controlled experimental condition. This does not mean that there are no effective strategies that can be implemented to address health inequalities.

There are three main mechanisms that can be distinguished through which socioeconomic health inequalities can be reduced (based on Kunst et al, 2001, Diderichsen et al, 2001; Programme Committee SEGV-II, 2001; Dahlgren and Whitehead, 2006):

1. Reducing the inequalities in socioeconomic position itself, such as education, income, or wealth.
2. Reducing the negative effect of a low socioeconomic position on health by improving determinants of health that are more prevalent among lower compared to higher socioeconomic groups, including:
 - a. living and working conditions
 - b. health behaviours
 - c. accessibility to and quality of health care and preventive services
3. Reducing the negative social and economic effects of ill health, such as school drop-out, lost job opportunities and reduced income.

Literature review

Within the HealthEquity-2020 project, an extensive literature review was carried out to find out what interventions, that fit within these three mechanisms, works in reducing socioeconomic health inequalities.

¹ We will henceforth use the term inequalities rather than inequities. Health inequities are considered avoidable differences in health that are unfair and unjust while health inequalities are more broad and also include differences due to biology or free choice. Since in practice the distinction is hard to make, we will use the term health inequalities.

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We considered a collection of umbrella reviews (review of reviews) that evaluated reviews of evidence on actions that could potentially tackle health inequalities. Additionally, we considered 'normal' literature reviews that evaluated evidence on important determinants of health by socioeconomic position. In the case of alcohol consumption, no literature review was available that considered socioeconomic differences. Therefore, we did a literature review of original studies in this case.

Below is an overview of the results of this literature overview. Additionally, the accompanying database with effective and promising interventions and policies can be accessed at the Health Equity 2020 Toolkit website: <https://survey.erasmusmc.nl/he2020/action-database/>

Improving socioeconomic position

There is ample observational evidence that supports the link between socioeconomic position and health (e.g. Davey-Smith et al, 1996; Link and Phelan, 1995, Mackenbach et al, 2010. Huisman et al, 2004, 2005; Martikainen et al, 2001; For an overview, see Glymour, Avendano and Kawachi, 2014). In addition, there are several natural experiments that indicate that extra years of schooling lead to lower mortality in later life (Lleras-Muney, 2005; Lager & Torssander, 2012). A review by Hahn et al (2015) shows that programs that increase high school completion are successful in increasing education in certain at risk groups. The authors therefore suggest that this would also advance health equity. However, Mackenbach (2015) states that better educational systems have the potential to increase health at the individual level but they may not be effective in reducing health inequality at the population level.

Re-employment programs may also benefit health and reduce inequalities. A recent review by van Rijn et al (2016) finds that re-employment programs for unemployed persons with severe mental health programs have a modest positive effect on the quality of life. In addition, an intervention study by Schuring et al (2011) showed that re-employment led to improvement of self-perceived health.

Improving determinants of health

Living and working conditions

Several studies (Bambra et al., 2010, Bambra et al., 2009, Cairns et al., 2014, Gibson et al., 2011, O'Dwyer

et al., 2007, Thomson et al., 2006, Thomson et al., 2013) reviewed the available evidence of interventions aimed at improving living and working conditions, such as housing, neighbourhood environment, traffic conditions and work conditions, and whether they were successful in reducing health inequalities.

Neighbourhood

The literature extensively discusses the evidence on residential mobility programs in the US where low-income residents are enabled to move to a different, more affluent, area (Acevedo-Garcia et al., 2004, Anderson et al., 2003, Gibson et al., 2011, O'Dwyer et al., 2007). These reviews indicate that residential mobility programs have the potential to increase health and health behaviours for those who moved. For example, the Moving To Opportunity program used tenant-based rental assistance (e.g. vouchers) so that low-income families can choose where to live (move to more affluent neighbourhoods). However, a critical note with residential mobility programs is that it is unclear what mechanisms are behind the health improvement of those who move and what happens to those residents that stay behind in the poor areas.

Another way to improve neighbourhood environment is to improve the areas themselves via urban regeneration or so-called area-based initiatives. Several authors provided overviews of the available evidence (Bambra et al., 2010, Gibson et al., 2011, O'Dwyer et al., 2007) and concluded there is some evidence that these area-based interventions are able to reduce health inequalities. A program that was evaluated frequently was the Health Action Zones (HAZ) in the UK. HAZs were multi-agency partnerships located in 26 deprived areas of the UK that focussed on community-based activities to tackle health inequalities (Judge and Bauld, 2006). Although overall the health impact of the HAZs was very limited, the program did contribute to building partnerships and raising awareness regarding health inequalities. The review by O'Dwyer et al. (2007) does suggest that some of the individual initiatives developed within the HAZs were effective in improving health in these deprived areas of England.

Another example of urban renewal projects comes from Barcelona, Spain. Barcelona has a history of urban renewal (Mackenbach et al., 2003, Mehdipanah et al., 2013). The municipal health policy towards Ciutat Vella was already evaluated positively with improved outcomes for infant mortality and adherence

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to tuberculosis treatment (Diez et al., 1996, Diez et al., 1995). More recently, in 2004, the government of Catalonia introduced the Neighbourhood Law (Llei de Barris) that enables municipalities to fund urban renewal projects within disadvantaged neighbourhoods. Mehdipanah et al. (2013) compared the health of residents from urban renewal intervention neighbourhoods with residents from non-intervention comparison neighbourhoods. They found that the intervention neighbourhoods had improved self-rated health and that these improvements were particularly in the manual social class resulting in decreased inequalities.

Housing

The review by Thomson et al. (2013) focussed on internal housing conditions and concluded that there is evidence that targeted housing investments aimed at warmth and energy efficiency can be beneficial to the health of the residents, especially for the most vulnerable groups such as those with inadequate warmth and those with existing health conditions. Although the interventions were hardly evaluated for different socioeconomic groups, the evaluated interventions were almost exclusively targeted towards low-income populations.

Traffic

The risk of road accidents is socioeconomically patterned and interventions aimed at reducing road accidents therefore have the potential to reduce health inequalities. The review by Cairns et al. (2014) indicates that interventions related to road traffic accidents, such as reductions of permissible alcohol when driving, area-wide traffic calming and speed cameras, are effective in reducing accidents and injuries. However, none of the interventions was evaluated according to socioeconomic position.

Work conditions

The evidence of interventions aimed at the psychosocial work environment was mainly discussed in an umbrella review by Bambra et al. (2009). They discussed evidence from seven literature overviews and concluded that structural workplace interventions have the potential to reduce health inequalities.

Interventions aimed at increasing employee control, e.g. via participatory employee committees, seem to be beneficial for employee health (Egan et al., 2007, Bambra et al., 2009). There were indications that these

effects were more pronounced amongst manual workers compared to higher level workers.

Interventions aimed at changes in the organization of work were also beneficial for health. Shift work interventions, such as switching from slow to fast rotation, changing from backward to forward shift rotation and self-scheduling of shift, and health and safety legislation benefited the employees while privatisation and the accompanying job insecurity and unemployment, was detrimental to the health of the employees. There was no evidence of differential effects of these interventions on different socioeconomic groups. However, many of these interventions could be targeted towards lower level employees and therefore contribute to reducing health inequalities. For example, a Dutch study showed that job rotation by dustmen reduced physical strain (Kuijjer et al., 1999, Mackenbach et al., 2003).

The work environment can also be used to address health behaviours of the workers. A successful approach via the workplace setting was described by Lang et al. (1995, 2000, Mackenbach et al., 2003). In France, it is custom to have occupational health services offer (mandatory) annual check-ups and preventive interventions to all employees. This provides opportunities for preventive actions such as smoking cessation and hypertension control. Lang et al. (1995, 2000) described how these occupational health check-ups and related preventative actions positively influenced smoking cessation and blood pressure. Although there was no specific evaluation on socioeconomic health inequalities, this approach is promising since it is able to reach all socioeconomic groups, something that is not always the case with other health behaviour interventions.

A review by Cairns et al. (2014) on the effectiveness of workplace interventions to tackle socioeconomic inequalities in obesity concluded that workplace counselling or advice-based interventions were ineffective in reducing health inequalities. However, workplace interventions that included physical activity programmes did have the potential to reduce inequalities in obesity if they were targeted towards lower occupational groups.

Health behaviours

Overweight & obesity

There was an abundance of systematic reviews assessing the impact of interventions aimed at

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reducing overweight and obesity. We also included all interventions aimed at only diet or physical activity and discuss them simultaneously. Several of the included reviews specifically focused on how these interventions could potentially reduce socioeconomic health inequalities (Beauchamp et al., 2014, Hillier-Brown et al., 2014a, Hillier-Brown et al., 2014b). Many others considered the effect of interventions targeted towards disadvantaged populations.

Pregnancy may be an important time to intervene to prevent overweight and obesity in both mother and child. However, there was no clear evidence about interventions that could help to reduce inequalities in excessive weight gain in pregnant women from low socioeconomic position (Skouteris et al., 2010).

For the prevention of overweight in young children (pre-school), there is more evidence available (Beauchamp et al., 2014, Hesketh and Campbell, 2010, Hillier-Brown et al., 2014b, Jouret et al., 2009, Laws et al., 2014, Waters et al., 2011, Wolfenden et al., 2012). Although there is still limited evidence on how to reduce inequalities in overweight and obesity in young children, there are some promising interventions available. It seems important to timely screen and refer children with an increased risk of overweight (Jouret et al., 2009). Promising elements of successful interventions were repeated home visits by health professionals or experienced peers (Johnson et al., 1993, Watt et al., 2006, Wen et al., 2012) and making healthy foods more accessible (for example via food subsidy programs or by making meals at pre-schools more healthy) (Black et al., 2012, Williams et al., 2002, Williams et al., 2004). Preventative interventions within existing care practices were also promising (Davison et al., 2011, McGarvey et al., 2004, Taveras et al., 2011).

Amongst older children, most interventions seem to be in the school-setting. Although there are many interventions that show a positive effect on diet, physical activity or overweight and obesity, relatively few studies show indications that school interventions can reduce inequalities in overweight, obesity or in physical activity or nutrition (Beauchamp et al., 2014, De Sa and Lock, 2008, Hillier-Brown et al., 2014b). However, there is also no evidence that these interventions increase inequalities.

There are several school interventions, targeted towards deprived neighbourhoods, that were successful in reducing overweight or improving related

health-behaviours. The most successful interventions were multi-component interventions that focussed on a multitude of factors (Beauchamp et al., 2014, De Sa and Lock, 2008, Hillier-Brown et al., 2014b) such as the provision of information (e.g. lessons on nutrition, water consumption, physical activity), improvement of the neighbourhood (e.g. healthy food in school canteens, placement of water fountains, active schoolyards), offering of activities (e.g. extra physical activity lessons, corporation with sports clubs) and the involvement of parents (Foster et al., 2008, Hollar et al., 2010, Jansen et al., 2011, Muckelbauer et al., 2009, van Sluijs et al., 2007, Wang et al., 2010).

Additionally, the provision of free fruit at schools seems to increase fruit consumption. A study in Norway gives an indication that this may also decrease socioeconomic inequalities in fruit consumption (Bere et al., 2005, Bere et al., 2007).

Both for children and for adults, there is evidence that integrated multi-sector community approaches could help to reduce inequalities in overweight and obesity. An Australian initiative (Be Active, Eat Well), that aimed to increase the capacity of people to develop initiatives to improve physical activity and diet in children (aged 4-12), was successful in preventing increases in body mass index (BMI) and waist circumference (Sanigorski et al., 2008). The increases in BMI and waist circumference were more pronounced in the lower socioeconomic groups in the control areas while there were no differences between socioeconomic groups in the intervention area.

A Dutch integrated community approach (Hartslag Limburg), aimed at improving cardiovascular health, was implemented in disadvantaged areas in the Maastricht area in the Netherlands (Schuit et al., 2006). A multitude of activities was organized and the main strength of the approach was the close cooperation between municipality, health services, and other stakeholders in the area. The program was effective in reducing the BMI of the participants.

Smoking

An umbrella review carried out by Main et al. (2008) on reducing inequalities in smoking, revealed that the only intervention that was proven to be effective in reducing socioeconomic inequalities in smoking was price measures such as tax increases. However, a critical note with price increases is that the poorer people who do not quit due to the increased prices, will be

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disproportionately affected which could lead to a deterioration in their socioeconomic position (Tariq et al., 2009).

There are several interventions that are promising for smoking cessation in pregnant women such as intensive counselling, peer support and financial rewards (Bauld et al., 2010, Chamberlain et al., 2013, Ford et al., 2013). These interventions were generally equally effective across socioeconomic groups.

For youth, population measures such as price measures and age-restrictions are effective in reducing smoking in this target group (Brown et al., 2014b, Thomas et al., 2008). However, it is unclear whether they have the potential to reduce inequalities in smoking.

The effects of school interventions is even less uniform (Brown et al., 2014b, Tariq et al., 2009, Thomas et al., 2008). Many interventions are not effective at all or do not differentiate between socioeconomic groups. A promising intervention is the 'A Stop Smoking in Schools Trial' (ASSIST) (Campbell et al., 2008, Mercken et al., 2012). This intervention makes use of informal peer networks by training popular students in each class to spread anti-smoking messages through informal communication. This intervention worked better in the more deprived areas included in the study.

As was already concluded in the umbrella review by Main et al. (2008), price increases are the most effective strategy to reduce socioeconomic inequalities in smoking in adults. This was further confirmed by several (later) review studies (Bader et al., 2011, Brown et al., 2014c, Tariq et al., 2009, Thomas et al., 2008). Other price-related measures, such as the free provision of nicotine-replacement therapy, may also contribute to reducing socioeconomic inequalities in smoking (Murray et al., 2009, Tariq et al., 2009).

Smoking bans, although effective in reducing smoking in general, are not successful in reducing socioeconomic inequalities in smoking (Brown et al., 2014c, Main et al., 2008, Thomas et al., 2008). Nonetheless, theoretically they have the potential to take away socioeconomic inequalities in second-hand smoke in the locations where there is a smoking ban.

There is mixed evidence that mass media campaigns can have an effect on smoking prevalence and the evidence with respect to their potential to reduce

socioeconomic inequalities in smoking is also unclear (Bala Malgorzata et al., 2013, Brown et al., 2014c, Durkin et al., 2009, Farrelly et al., 2012, Guillaumier et al., 2012, Niederdeppe et al., 2008, Vallone et al., 2011a, Vallone et al., 2011b). Possibly, more personal or emotional messages in ads appeal more to lower socioeconomic groups (Vallone et al., 2011a, Vallone et al., 2011b). On the other hand, there is also evidence that mass-media campaigns may increase inequalities in smoking (Lorenc et al., 2013, Niederdeppe et al., 2008).

Although the effect of health warnings on tobacco products on actual quit rates is limited, there are some subtle indications that lower socioeconomic groups are impacted more (Hitchman et al., 2012).

Individual-level interventions, such as behavioural and pharmacological interventions, are in general more effective in higher socioeconomic groups compared to lower socioeconomic groups (Bauld et al., 2010, Brown et al., 2014a). Therefore, they have the potential to increase inequalities in smoking. However, the approach adopted by the UK National Health Service (NHS) stop-smoking services showed an overall positive equity effect. The lower quit rates in the lower socioeconomic groups were compensated by a strong targeted approach to increase uptake of the services among the lower socioeconomic groups (Bauld et al., 2010, Brown et al., 2014a).

Although individual level interventions are often more effective in higher socioeconomic groups, they could be effective in reducing health inequalities when specifically targeted towards the more disadvantaged population. Some effective interventions that were targeted specifically to deprived populations were for example:

- the 'Quit for Life' programme implemented in a deprived neighbourhood in London was effective in reducing smoking in those who participated in the program (Sykes and Marks, 2001).
- a US intervention, implemented via 'planned-parenthood clinics' and aimed at low-income women, was effective in reducing smoking in this group (Glasgow et al., 2000).
- a US intervention, implemented via public dental clinics in deprived areas, was also effective in reducing smoking (Gordon et al., 2010).

Two of these interventions reached the target group via existing health care facilities. Torchalla et al. (2012) also stress that implementing smoking cessation

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interventions via routine care facilities, such as general practitioners, may be a good strategy to reach the low-income groups.

Alcohol

Alcohol interventions can already start before and during pregnancy. Just as in obesity prevention, we see that young deprived mothers (to be) and their offspring benefit from regular home visits from nurses during and after pregnancy. In the Nurse-Family Partnership (Kitzman et al., 2010, Olds et al., 2010), the alcohol and drug use of children at the age of 12 was reduced for those whose mothers were visited during pregnancy and infancy. Mothers themselves experienced less role restrictions due to alcohol or drug use 10 years after the end of the program.

Targeted brief interventions, such as the ones based on motivational interviewing, can be effective in reducing alcohol consumption as well, both in pregnant women as in other people from low socioeconomic status (Beckham, 2007, Marais et al., 2011, Mertens et al., 2014). It is important that these brief interventions are delivered face-to-face, e.g. via a general practitioner or midwife, and not via internet since there is evidence that online brief interventions potentially increase inequalities in alcohol consumption.

School interventions were in general not very effective in reducing alcohol consumption or did not show a differential effect for different socioeconomic groups. However, there were several promising school interventions. An important element of these interventions, compared to most of the other interventions, seem to be the parent involvement (Koning et al., 2009, Verdurmen et al., 2014, Caria et al., 2011, Vigna-Taglianti et al., 2014).

Inter-sector (targeted) neighbourhood interventions have the potential to decrease alcohol consumption on the neighbourhood and reduce problems affiliated with excessive drinking. These neighbourhood interventions should be backed up by police enforcement and licence inspectors (Anderson et al., 2009). An example of such an intervention, implemented in a deprived neighbourhood in the US, is the Sacramento Neighbourhood Alcohol Prevention Project (SNAPP). This project included interventions aimed at five areas: 'a mobilization component to support the overall project, a community awareness component, a responsible beverage-service component, an underage-access law enforcement

component, and an intoxicated-patron law enforcement component.' (Treno et al., 2007). The intervention was successful in reducing problems caused by excessive alcohol consumption such as assaults and motor vehicle accidents.

Measures that address the accessibility or availability of alcohol are effective in reducing alcohol consumption. Moreover, they are promising in reducing inequalities in alcohol consumption. Increasing the age limit has a stronger effect on the lower socioeconomic groups and therefore has the potential to decrease inequalities in alcohol consumption (Plunk et al., 2013). Evidence also shows that the price elasticity of alcohol products is larger in lower socioeconomic groups (Ayyagari et al., 2013, Helakorpi et al., 2010, Herttua et al., 2015, Holmes et al., 2014). Therefore, increasing prices for alcohol, such as minimum unit pricing, has the potential to decrease inequalities in alcohol consumption.

Accessibility to and quality of health care and preventive services

Only few reviews paid attention to the differential effects of interventions aimed at health care and preventive services.

With respect to inequalities in accessibility to health care and preventive services, it is possible to distinguish between problems due to geographical access, economic access, and cultural access. Geographical access may be improved by (rural) outreach programmes (Bambra et al., 2010, Gruen et al., 2006). There was inconclusive evidence of the effectiveness of interventions aimed at cultural access (Bambra et al., 2010). Evidence from low- and middle income countries suggest that interventions aimed at removing the economic restrictions to accessing health care (e.g. health insurance programs and conditional cash transfers) are effective in reducing inequalities (Yuan et al., 2014). However, no evidence could be identified within high-income countries (Bambra et al., 2010). One review on the use of folic acid supplements does suggest that the provision of free folic acid supplements could improve the use of this vital supplement, especially in low-income and young women (Robbins et al., 2005, Stockley and Lund, 2008, Watkins et al., 2004). Only providing information or education on folic acid use may actually increase inequalities.

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Mackenbach et al. (2003) identified a promising intervention that was based on the introduction of nurse practitioners in general practice offices in deprived (mostly rural) areas. The nurse practitioners specifically targeted (low income) patients with chronic obstructive pulmonary disease and asthma and they provided extra attention and counselling to improve treatment compliance and, as a result, health of the patients (Sorgdrager et al., 2001).

Reducing the negative effects of ill health

The last mechanism through which socioeconomic health inequalities can be reduced is by reducing the negative effects of ill health on socioeconomic position. This was only touched upon briefly within the series of literature reviews. One successful policy was the protection and active promotion of labour market participation of chronically ill workers in Sweden. Burstrom et al. (2000) compared data from Sweden and the UK and concluded that the employment rates were higher and the rates of unemployment and economic inactivity were lower in Sweden than in Britain, and the differences in these rates across socioeconomic groups and between those with and without chronic illness were smaller in Sweden.

Interventions that can increase inequalities

Although reducing socioeconomic inequalities in health may sometimes be difficult, we should try to avoid to increase health inequalities by choosing interventions and actions that do so. Lorenc et al. (2013) reviewed what interventions could potentially increase inequalities. They concluded that especially media campaigns had the risk of increasing socioeconomic inequalities in health. Also some other interventions, such as workplace smoking bans, printed communication materials to promote folic acid intake and some school-based interventions aimed at physical activity and/or healthy eating had the potential to increase inequalities.

Conclusion

There are relatively few interventions that have proven to reduce socioeconomic inequalities in health. However, there is an increase in attention to develop and evaluate interventions for different population groups. This increase in attention will hopefully increase the evidence in the future which makes it easier to inform policy and practice.

We observed what could be named the 'inverse-evidence-law'; we see many evaluation studies that

address those interventions of which we only expect minimal impact (e.g. individual cognitive health behaviour interventions) and little studies on interventions that we expect most impact from (e.g. multi-component, multilevel interventions that address both individual and environmental factors).

The literature review conducted to prepare the Health Equity 2020 database was very comprehensive but cannot be complete. Additionally, the interventions, policies and programs mentioned above and included in the database are a reflection of the available evidence. There may be many more, very promising, interventions available in the field that just never have been evaluated or never have been evaluated with respect to different socioeconomic groups.

A conclusion that can be drawn is that a single measure is not expected to decrease health inequalities significantly. A package of multiple measures is needed to achieve this. Promising elements of interventions are price measures, multi-layer and multi-component interventions that also consider physical and social environmental measures and involve multiple family members (e.g. parent and children), involvement of (existing) health services, and attention to underlying skills (e.g. health literacy). Brief interventions targeted towards lower socioeconomic groups may also be effective in improving health behaviours in this group. In addition, it seems to be very important to pay ample attention to cooperation and capacity needed to develop and implement the action and to reach the appropriate (disadvantaged) target group.

The **Action Database** can be accessed at: survey.erasmusmc.nl/he2020/action-database/

The full **Health Equity 2020 Toolkit** can be accessed at: survey.erasmusmc.nl/he2020/

More information on the **HealthEquity-2020 project** can be found at: www.healthequity2020.eu

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HealthEquity-2020: Equity is about fairness and justice. Promoting equity is essential if human and social development is to be combined with economically productive societies. Reducing health disparities is important, and the upward trends for such differences call for further innovative, collaborative actions at all levels. The general objective of the HealthEquity-2020 project is to assist Member States & regions to develop evidence-based regional action plans on reducing health inequalities, which also informs the use of Structural Funds in the present and new programming period.



Co-funded by the
Health Programme of
the European Union

This policy brief arises from the project HEALTH EQUITY – 2020 which has received funding from the European Union, in the framework of the Health Programme. This policy brief does not necessarily reflect the commission's views and in no way anticipates the commission's future policy in this area.