



The ethics of behaviour-based insurance models: Solidarity-based concerns in Germany's statutory health insurance

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ABSTRACT

Sickness funds have begun to harness digital behavioural data to incentivise physical activity in their members. This ethical and societal effects of this phenomenon remain largely unclear, especially in solidarity-based insurance systems. Therefore, this study analysed the risks and benefits of such programmes with respect to solidarity against the background of recent efforts by German statutory health insurance funds to integrate digital tracking data into their bonus programmes. Key, potential benefits include new forms of solidarity that may emerge based on sharing personal health data. The incentives introduced by these reward programmes could lead to efficiency gains used to benefit society. However, three conceptual pitfalls have been identified: First, the data gathering method may penalise certain vulnerable groups. Such discrimination could, however, be avoided by minimising barriers to participation. Second, digitally mediated bonus programmes may create deadweight effects, i.e. beneficiaries are likely to already be healthy and active. Consequently, behavioural targets should be designed to consider individual prerequisites. Lastly, linking premiums to behaviour might diminish solidarity with poor risks within statutory health insurances and between statutory and private health insurance. Hence, this study aimed to stimulate debate on the ethical and societal implications of the systemic integration of eHealth innovations into healthcare systems.

1. Background

The use of digital activity-tracking devices (wearables) has become increasingly prevalent in German society. With 6.6 million users in 2024 [1], wearable devices have become a mainstream phenomenon, with individuals often using these devices to monitor their health and well-being. However, the behavioural data obtained through these devices have become of interest to third parties, both in Germany and elsewhere [2].

In Germany, health insurance (HI) uses this data to offer 'pay-as-you-live' business models, which de facto introduce individual premiums based on insurance members' activity data [3]. While considerable variability exists concerning the features of individual programmes, a typical, digitally mediated, bonus programme consists of three items, whereby members a) qualify for a direct or indirect financial reward b) for meeting pre-specified levels of physical activity (e.g. 10,000 steps per day), c) which can be automatically measured using personal digital health-tracking devices (Apple Watch, Fitbit, etc.) and/or smartphone

apps.

Generally, these rewards are intended to incentivise healthy behaviour. Such behaviour-based insurance policies constitute what has been termed a 'prevention policy' in the insurance context [4,5]. In this respect, the phenomenon may be regarded as part of a larger paradigm shift towards the primary prevention of disease [6]. German statutory HIs (SHIs) have set up bonus programmes to incentivise their members to partake in preventive measures. By law, these bonus programmes must be financed from savings and efficiency gains that the insurers reap from measures in the area of behaviour-based prevention (§ 65a III SGB V). Thus far, participation in such bonus programmes is voluntary. Programmes that are (de facto or de jure) mandatory or coercive come with other challenges and are not discussed here. Nonetheless, and in the context of social insurance [5], the combination of monetary incentives with the precision of digital behaviour tracking may have profound consequences. In this paper, we analysed the effects of these policies against the background of Germany's solidarity and redistributive SHI. We attempted to answer two questions: 1) What effects do

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digitally mediated behavioural insurance policies have on the solidarity inherent in the German statutory insurance system? and, 2) if there are potential problems or challenges, how can these be alleviated? We conducted a risk-benefit analysis of digitally mediated behavioural insurance policies concerning solidarity to identify both the positive effects on, and the potential sources of conflict with, solidarity at the core of the German SHI system and discuss potential measures to address these conflicts. We do not address other contested issues of health-related digital activity tracking, such as data security and privacy [7–9], and only briefly tackle the effectiveness of monetary incentives to increase physical activity [10–12]. While we focus on the German SHI system, the risk-benefit analysis can also be applied to other national insurance systems that are founded on or inspired by solidarity, e.g. in Canada and across most of Europe.

2. Methods

2.1. Background

The German healthcare system is a dual system consisting of statutory (public) HI and a separate private system, with a little less than 90 % of the population using SHI [13]. While HI is mandatory, individuals who meet certain requirements, such as earning more than €73,800 gross income per year (in 2025), can choose to opt out of SHI and purchase a private plan instead. Private health insurance (PHI) is based on private law contracts between the insurer and insuree.

A central conceptual and legal leitmotif of German SHI is solidarity (§ 1 S. 1 and § 3 Social Code Book V [SGB]). One major effect of the law's emphasis on solidarity is to enable healthy and/or well-off individuals to assist their sicker and/or less well-off peers through the redistribution of insurance contributions/payments. Solidarity manifests itself in the determination of premiums and the provisioning of health services. Premiums are determined based solely on insurance members' financial ability, while services are provided based on medical need only [14,15]. As such, SHI is predicated on the recognition of all members' shared vulnerability to disease risks, *without* considering individual (behaviour-based) risks. The strong focus on solidarity may be regarded as an expression of the central role that solidarity plays in German social policy at large.

2.2. Method

The statutes, implementation regulations, conditions of participation and information leaflets of the ten largest German SHIs were screened for digitally mediated, behaviour-based insurance policies, and a thematic literature search was conducted to obtain further empirical results. On this basis, a solidarity-focused, risk-benefit analysis of the identified policies was conducted. The result is a narrative review of the (un)intended effects of these policies and their consequences for solidarity within the German HI system. We then discuss possible measures to ameliorate the negative effects on solidarity and draw inferences on the wider international context.

2.3. Theoretical foundation

As neither the Social Code Book nor the German legislature provides a detailed, substantiated account of solidarity (and to keep the analysis at manageable length) we restricted our understanding of solidarity to the model suggested by Prainsack and Buyx [16,17]. We used this as the framework for our analysis as it is sensitive to the degree of institutionalisation reflected in specific actions or practices. Within this framework, the term solidarity signifies “shared practices reflecting a collective commitment to carry ‘costs’ (financial, social, emotional or otherwise) to assist others with whom a person or persons recognise similarity in a relevant respect” [16]. Costs can be further defined as all types of contributions a person / entity undertakes to assist another

person / entity. Aside from money and time, costs could, for example, include effort, renouncing comfort, or hiding one's feelings. The condition of “similarity in a relevant respect” is fulfilled if “one has something in common with the person that matters in a specific situation” [17]. Consequently, an act of solidarity is evoked by commonalities, not differences between people or entities. Such commonalities may be a shared vulnerability (to disease, etc.), a shared threat (such as climate change) or shared values (e.g. liberal democracy). The focus on similarities distinguishes solidarity from charity as charity draws from differences (e.g. the rich donate to the poor).

Prainsack and Buyx distinguish between three tiers of solidarity: (1) the inter-personal level, (2) group practices, (3) and the legal level. The German SHI system is a prime example of Tier 3 solidarity as it constitutes institutionalised solidary practices with obligatory contractual and legal manifestations.

3. Results

3.1. Empirical results

The screening of currently available behaviour-based bonus programmes that require the use of a personal fitness tracker revealed two different approaches (see Table A1 in Appendix 1). Some SHIs give their members the choice to provide evidence of one of three healthy behaviours: 1) step counts in excess of 10,000 per day, 2) prolonged periods of cardiovascular activity (i.e. a heart rate above 120 beats per minute for at least 30 min) and 3) calorie burning (150 kilocalories within 30 min). Similarly, another sickness fund offers reward points for more than 60,000 steps taken or more than 40 km of cycling in ten out of twelve weeks [18,19]. The behavioural data are gathered via wearable devices or smartphone apps. For this, the fitness app must be compatible with and connected to the app offered by the SHI to administer and monitor the individual's participation in the bonus programme. The tracked activity is then automatically transferred to the digital bonus programme. In return for the tracked activity, participants receive bonus points. In one case, the maximum reward per year is 60,00€. In other cases, each activity equals 50 bonus points (=0,50€). Together with bonus points collected for other preventive measures (e.g. buying a fitness tracker, donating blood, receiving dental check-up) the points can be either exchanged for money (cash payment at the end of the year) or serve as a subsidy for other health expenditures the insurance members would otherwise have to pay out-of-pocket. In the latter case, the points are doubled by the insurer.

A mixed-methods analysis of relevant documents and semi-structured interviews with experts, bonus programme participants and bio-hackers (i.e., persons who are part of a do-it-yourself-movement and who aim to change or improve their body with the help of biological, chemical or technical means) revealed that there remains debate regarding whether such programmes have a scientifically verified, preventive benefit. Nonetheless, the ‘pay-as-you-live’ programme appears to pay off financially for the programme participants [20]. A population-representative survey published in 2019 concluded that the use of health-tracking applications may change users' attitude towards solidarity over the long term, with users much more likely to reject the solidarity principle in HI. This rejection may be explained by users' increased knowledge and feelings of control over their health behaviour and values [21].

3.2. Potential positive effects on solidarity

3.2.1. New forms of solidarity and societal benefits from data sharing

The rising popularity of self-tracking may give rise to new forms of solidarity in health-tracking communities [22]. Unlike traditional, non-digital forms of self-tracking, wearables allow for effortless sharing data with others. Communities may evolve based on shared problems or targets and acts of solidarity (in Prainsack's and Buyx's sense) may be

carried out within these communities. Such acts could result in sharing data for collective insights, shared (knowledge) resources and advice as well as emotional and motivational support. Thus, the strong communal character of these practices should not be disregarded [23].

Moreover, while such forms of data sharing raise issues about privacy and data security [7–9], data sharing can have social benefits. Shared data may be regarded as a public good, i.e. an asset useful to society at large. If this idea is taken seriously, “solidarity becomes almost synonymous with data sharing” [24] as individuals are willing to sacrifice their privacy (i.e. carry costs) to assist others by contributing to solidarity-based purposes. A noteworthy example is the Data for Good campaign launched by the online network Patients Like Me [25]. This campaign encourages patients to share personal health information to advance medical research. Similar campaigns for behaviour-tracking could yield valuable insights into prevention and its favourable and hindering factors.

3.2.2. Efficiency gains for the benefit of the solidarity community

Proponents of self-tracking expect positive health effects for participants and a corresponding decrease in overall healthcare costs, which may be used to benefit the community. While the effectiveness of incentives to induce health-behaviour change remains contested [26], for argument’s sake, we assume that digitally mediated reward programmes can lead to increased physical activity. This is in line with preliminary data from insurers in the United States, which have suggested that financial incentives for behaviour change in the insurance context can be effective [2] and that a reward programme (with an Apple Watch for instance) can significantly increase physical activity compared to an active reward programme without an Apple Watch [11]. From the perspective of the SHIs, an active member incurs, on average, fewer healthcare costs than a sedentary one. By incentivising active behaviour, bonus programmes counteract the moral hazard of insurance members’ failure to invest in prevention. Moreover, the programmes can counteract adverse selection in favour of private health plans, as they tend to attract good risks, i.e. individuals who are likely to make lower claims than average [27–29]. Finally, they have the potential to assist in individualised tariffs based on risk profiles compiled from digital tracking data [30].

The aforementioned possibilities of digitally mediated reward programmes could lead to a decrease in overall healthcare costs [30]. These savings could, potentially, enable the solidarity community (§ 1 S. 1 SGB V) to increase its solidarity with the needy without incurring additional costs, i.e. the gains from implementing reward programmes could be shared among the solidarity community. While it is not self-evident that the potential cost savings would be redistributed in this way, the idea that the stability of healthcare systems under increasing financial pressure depends on individuals taking on more personal responsibility for their health has been frequently articulated [23]. In this respect, the pressure to improve one’s lifestyle via financial incentives [31] may be seen as a form of reciprocity. It has been argued that solidarity entails an obligation to reciprocate in accordance with individual ability [32]. Interpreting solidarity as reciprocity implies that, given the scarcity of resources in healthcare systems, one would expect recipients to invest more in their health to limit their claims towards social insurance. In the following sections, we will explain the potential problems with this interpretation of solidarity.

3.3. Potential negative effects on solidarity

3.3.1. Exclusion from measurement

Bonus programmes based on tracking data could reduce the solidarity extended to vulnerable groups who are unable or unlikely to participate in such programmes. First, solidarity towards individuals with physical impairments could be reduced. For instance, step counts, a common target measure, inherently disadvantage wheelchair users, preventing their participation. Similarly, individuals with a low socio-

economic status (SES) could be disadvantaged. Low SES individuals are less likely to engage with eHealth applications or use their smartphones to track their health [33]. Two reasons may contribute to this: First, a low SES is usually tantamount to low disposable income. The devices required for participation in some of today’s programmes are, however, expensive and several rewarded measures (e.g. heart rate) can only be recorded using wearables. Second, Neter and Brainin [34] found that a low SES tends to correlate with low eHealth literacy, which, in turn, may negatively affect insurance members’ success in these programmes.

Individuals with low eHealth literacy, independent of their SES, are less likely to (successfully) engage in digitally mediated reward programmes. They tend to have a lower ability to “seek, find, understand and appraise health information from electronic sources and apply knowledge gained to addressing or solving a health problem” [34]. Two major components of eHealth illiteracy are low digital literacy and low health literacy. Digital literacy can be broadly understood as the skills and resources necessary to navigate digital environments [35], and poor digital literacy has frequently been associated with older age [36–38]. Health literacy entails the ability to “read, understand, and act on health care information” [39] and is vital for effectively tracking and changing health behaviour. Without both sets of skills, following instructions or engaging in appropriate self-care activities is more difficult.

In sum, the de facto exclusion from reward programmes puts various groups at a disadvantage relative to other insurance members. Therefore, solidarity with these groups may be diminished. This situation represents a new iteration of the well-known challenges of putting increased emphasis on personal responsibility in behaviour-based insurance premiums [40]. Certain groups do not have the resources and capabilities to independently track, report and adapt their health behaviour in ways required by these programmes.

3.3.2. Deadweight effects and self-selection

A second set of challenges centres on the rewards themselves. The programmes could create deadweight effects, whereby the most likely beneficiaries of bonus programmes are individuals who already engage in the behaviour that is being incentivised. In direct comparison with those individuals who are often in good health, less healthy insurance members would benefit more from participating in the behaviour-based bonus programme as the marginal gains for them are larger.

Empirically, this is supported by the fact that regular exercise tends to be associated with a more positive attitude towards programmes rewarding physical activity in SHI. These attitudes are likely to be self-serving, as non-sedentary individuals anticipate future rewards from bonus programmes by HIs [21]. In line with these arguments, reward programmes tend towards the self-selection of good risks, as some insurance members may find the standards set by insurers unattainable [27]. Consider, for example, a sedentary, 70-year-old woman with knee pain. Under the current programmes, she must demonstrate the same level of physical activity as an active 20-year-old. Such unattainable goals are likely to reduce the programme’s motivational impact and may even have negative effects on her well-being (e.g. anxiety or despair) [41,42]. More importantly, however, she is unlikely to participate in the programme at all. The 20-year-old, in contrast, might just report their regular exercise and be rewarded for their regular behaviour. This tendency towards self-selection has been empirically demonstrated for non-digital bonus programmes offered by German insurers [27,43]. This self-selection is exacerbated by the fact that the use of mobile health applications is currently skewed towards individuals “who need the least help, i.e. the young, the fit, and the educated” [40].

These programmes create a *prima facie* arbitrary distinction between healthy and unhealthy behaviours, which reduces the costs carried by good risks to assist bad risks and could diminish solidarity. This is especially problematic as sedentary individuals are disproportionately likely to belong to vulnerable groups, and the likelihood of various lifestyle-related diseases is significantly increased by sedentary

behaviour [44]. Similarly, numerous studies have shown that sedentary lifestyles (and other health-risk behaviours) are associated with a low SES [45]. Crucially, the association between sedentary behaviour with a low SES might not be indicative of voluntary individual choices, but, rather, reflect the fact that high income is a prerequisite for the opportunity to exercise. Higher incomes enable individuals to choose better behaviours. In this respect, tracking-based rewards reflect existing inequalities and exacerbate them [46]. Moreover, this known tendency towards self-selection could be misused by SHIs to attract good risks (in competition with other SHIs). This could potentially increase the de-solidarization between good and bad risks if the mechanisms to correct for differences in the risk structure between SHIs [47–49] are not adapted to counteract the effect of the rewards programmes.

3.3.3. Digital risk stratification

Digitally mediated reward programs introduce risk stratification based on digital activity data within SHIs. Such rewards, paid in cash, can be regarded as a de facto reduction of the health insurance contribution each member must pay. This challenges the solidarity of the German SHI system, which traditionally bases premiums solely on financial ability and not on other factors such as the extent of physical activity. If the financial impact of behavioural data increases, risk stratification within SHI could pose a significant threat to solidarity. This scenario is not implausible as sickness funds have a considerable interest in gathering behavioural data and tailoring tariffs accordingly [30,50,51].

Moreover, the risk stratification between SHI and PHI could be exacerbated by digitally mediated bonus programmes. As with traditional bonus programmes, digitally-mediated ones can function as marketing instruments for PHIs to attract good risks (self-selection) [52]. Additionally, PHIs could ask insurance applicants who want to switch from statutory to private insurance to disclose if they track or tracked their health behaviour (e.g., by participating in a bonus programme offered by their SHI). Given that the applicant is the owner of the health data, PHIs could lawfully ask them to disclose the wearable data for ex-ante risk assessments and, consequently, deny coverage to bad risks. Even though this is still a future scenario, tracking devices are likely to make such risk-assessments more effective, as increased technological possibilities could significantly decrease asymmetric information and uncertainty regarding health outcomes [51,53,54]. This may amplify the existing risk segmentation in favour of PHI and, therefore, increase the financial burden within SHI [55,56].

In this respect, vulnerability regarding diseases—which is one relevant commonality of insurance members and, hence, can act as a trigger for actions of solidarity [16]—could be eroded. Tracking devices could become a potent means to demonstrate low or lower vulnerability. They could also foster the desire to be rewarded for this low vulnerability. There is evidence suggesting that wearables may contribute to a more favourable attitude towards de-solidarisation of SHI by rewarding healthy behaviour [21]. It appears that regular monitoring of one's health behaviour via tracking devices could, by itself, weaken solidarity with unhealthy (e.g. sedentary or malnourishing) lifestyles. On a broader level, behaviour-based personalisation of HI has the potential to erode the reference groups and socio-political categories individuals might identify with. When insurance members are represented by data points based on individual behaviour, consolidating groups that can recognise themselves as such becomes difficult. Unlike traditional statistical risk factors, behavioural categories are dynamic, and both individual scores and corresponding reference groups are in constant flux [57,58]. This threatens solidarity because the recognition of similarity and “the capacity to summon as a ‘we’” [31] provide the foundation for making commitments to support others. The integration of wearables into behaviour-based insurance policies might contribute to a constant competitive stance [59] between insurance members as individual behaviour feeds back into the categorisation of policyholders [31,60].

4. Discussion

The risks of digitally mediated bonus programmes to solidarity raise questions of how negative effects can be alleviated and a balance between the benefits and harms of self-tracking technologies can be achieved.

In discussing these questions, we largely leave aside the problem of inaccurate mobile health applications [61–63], which could unfairly keep individuals from earning rewards or enable cheating. Instead, we focus solely on solidarity and refrain from weighing the potential effects on solidarity against other ethical concerns. Others have, for instance, discussed self-tracking in regard to user autonomy [64] or advocated for it based on the notion of ‘taking responsibility’ for one's health [65].

4.1. Exclusion from measurement

Two features may help maintain solidarity with groups that are vulnerable to exclusion from measurement. First, insurers could offer more alternative ways by which members can demonstrate their healthy lifestyles to maximize the number of policyholders who are, at least physically, able to participate. However, this set of alternatives is contingent on the technological possibilities regarding measurement [66]. Second, individuals who are physically unable to participate in the reward programmes could be compensated. Bonus programmes are, to a large extent, based on the notion of personal responsibility for one's health. One might argue that someone who is physically unable to demonstrate a healthy lifestyle in a specific, but also arbitrary, manner should not be held responsible for it.

Likewise, sickness funds could make measurement technology more affordable. For instance, wearables could be subsidised [3], or SHIs could attempt to integrate more data that can be collected via smartphones. In addition, technological barriers could be reduced to maximise accessibility. For instance, programmes could be designed for low digital literacy or use simple language. Finally, SHIs should specifically inform and assist groups that are statistically less likely to engage with eHealth applications (e.g. the elderly and individuals with a low SES). However, this is likely to have only limited effects as certain groups (e.g. very old, or severely impaired individuals) will probably be unable to successfully participate, even with well-intentioned programmes.

4.2. Deadweight effects and the bonus systems

To limit the severity of deadweight effects, it is often recommended to avoid rewarding ideal states (e.g. body mass index). Rewarding results not only creates deadweight effects, it also disregards the fact that such parameters are multifactorial and do not exclusively depend on the level of physical activity [67]. Rather, parameters such as effort and improvement could be considered [50]. While step counts—a typical cornerstone of current programmes—do not measure results directly, one must already be close to an ideal state to achieve the required step count (i.e. one must be fit enough to walk at least the required distance every day). Thus, SHIs could take into account the capabilities and backgrounds of different participants [50]. For instance, considering factors such as sex, age and co-morbidities when setting targets could help alleviate some aspects of the self-selection of good risks into digitally mediated bonus programmes. Lastly, intra-individual improvement, rather than just absolute performance, could be rewarded.

4.3. Digital risk stratification

To limit the extent to which digital risk stratification threatens solidarity, and in light of the empirical finding that the ‘pay-as-you-live’ programme already pays off financially for programme participants [20], the financial stakes could be kept to a minimum. A regulatory cap on financial incentives could protect solidarity. However, it may also limit health benefits from incentivizing prevention and, if not extended

to PHI, risk worsening self-selection between SHI and PHI. While a detailed discussion of the SHI-PHI interplay is beyond the scope of this paper, three options should be mentioned: (1) banning ex-ante risk assessment and behaviour-based tariffs [51], (2) requiring PHIs to make risk-adjusted transfers to SHIs [56] in addition to the existing mechanisms within SHIs [47–49], or (3) fully integrating PHI into SHI [68]. Each approach presents trade-offs, but aligning incentive schemes with SHI's solidarity principles remains a key challenge. Reconciling the efficiency gain from incentive schemes enabled by technological progress with the solidarity ethos of Germany's HI system, while not easy to achieve, would be a worthwhile goal.

5. Conclusion

The benefits of wearable health-tracking devices and their use in behavioural HI policies have been frequently discussed. However, their consequences for solidarity within (statutory) HI have been largely overlooked. By understanding solidarity as the commitment of a collective to carry 'costs' to assist others, we have identified three key aspects insurers and policy makers should consider to minimise the programme's negative effect on solidarity. Insurers should maximise accessibility for disadvantaged groups and implement reward systems that are suitable to reduce deadweight effects. Moreover, policy makers should carefully evaluate the fact that the programmes introduce risk stratification based on digital, individual data.

Our arguments extend beyond digitally mediated bonus programs in German SHIs. First, our analysis applies to other solidarity-based HI systems, such as those in the United Kingdom and The Netherlands.

Second, our findings are relevant not just to bonus programmes but to HI pricing as a whole. The shift toward personalized premiums—pricing based on individual behaviour rather than group membership—contradicts the principle of solidarity. This trend may also manifest through ex-ante risk assessment using tracking data. Such

Appendix 1

Table A1

Digitally-mediated, behaviour-based insurance policies.

SHI	Insurees in 2024 [a]	Incentivised Behaviour	Incentive/ Reward
Techniker Krankenkasse [b]	11.660.531	TK Fit Challenge: walking 60,000 steps or cycling 40 km in ten out of twelve weeks and answering questions to fitness lessons in the app	Bonus payment in cash or used for a 'health dividend' (= subsidy for health expenditures that are used by the insuree)
BARMER [c]	8.497.027	–	–
DAK Gesundheit [d]	5.484.170	–	–
AOK Bayern [e]	4.617.337	1) burning 150 kcal within at least 30 min, or 2) average heart rate above 120 bpm for at least 30 min, or 3) 10,000 steps per day	50 bonus points per activity; max. one activity per day and 15 activities per month are rewarded. Bonus payment in cash or subsidy for health expenditures 0,25€ per activity, max. 60,00€ per year are rewarded
AOK Baden-Württemberg [f]	4.607.248	1) burning 150 kcal within at least 30 min, or 2) average heart rate above 120 bpm for at least 30 min, or 3) 10,000 steps per day	50 bonus points per activity; max. one activity per day and 15 activities per month are rewarded. Bonus payment in cash or subsidy for health expenditures
AOK Plus [g]	3.498.365	1) burning 150 kcal within at least 30 min, or 2) average heart rate above 120 bpm for at least 30 min, or 3) 10,000 steps per day	50 bonus points per activity; max. one activity per day and 15 activities per month are rewarded. Bonus payment in cash or subsidy for health expenditures
AOK Niedersachsen [h]	3.064.386	–	–
AOK Rheinland/Hamburg [i]	3.012.377	–	–
IKK classic [j]	3.006.002	–	–
AOK NordWest [k]	2.962.055	–	–

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digital risk stratification affects HI beyond bonus programmes.

Finally, while our analysis focused on solidarity, further investigations should balance solidarity against other, potentially conflicting moral principles. Even though solidarity is a necessary component in any discussion of justice, equity and social responsibility for healthcare, the latter concepts require a more comprehensive discussion. This should include critical issues such as the role of big tech in healthcare and the debate on the interplay between health and economics.

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CRedit authorship contribution statement

Carl Justus Bredthauer: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Formal analysis. **Eva Kuhn:** Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration, Methodology, Formal analysis, Conceptualization. **Alena Buyx:** Writing – review & editing, Writing – original draft, Supervision, Funding acquisition, Formal analysis, Conceptualization.

Declaration of competing interest

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