

Health apps



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Summary

- › There is a broad variety of health apps which is constantly being expanded. The offer ranges from fitness and nutrition apps to apps providing support in case of illness.
- › With constantly new functionalities, these apps open up innovation potentials by accompanying everyday forms of people's health behaviour in an individually adapted way.
- › Numerous health apps are developed for people with chronic diseases to support them in coping independently and actively with problems of everyday life and making competent decisions.
- › However, despite of the large number of health apps, there is only little evidence regarding the benefits as well as the health-promoting and preventive effects of these apps.
- › The market for health apps is only little regulated. Moreover, there is a lack of reliable quality control taking into account particularly the issue of data protection.

What is involved

Apps (short for application software) increasingly determine everyday life in society. More and more often, people are using apps in combination with mobile devices (e.g. smartphones) with the aim of positively influencing their health. For example, health apps help to improve athletic performance, remind people to take their medication or give nutritional advice. For this purpose, the apps collect, process and visualise health-related data. These can be data on nutritional values (calories), quantities and composition of the food consumed, alcohol, water, coffee or nicotine, but also body data such as step count, pulse, calorie consumption, blood sugar/glucose, temperature, weight, breathing or quality of sleep. Moreover, the data collected and processed by health apps include measurements of physical activity – such as sport, sleep or sex – as well as emotional or mental well-being.

As a general rule, health apps are offered on specific marketplaces on the Internet – the so-called app stores. The best-known and most frequented marketplaces are the Google Play Store (Android) and the Apple App Store (iOS). Currently, the stores offer more than 100,000 health apps of various categories such as fitness, wellness, lifestyle, food and beverages as well as medicine. As a result of the dynamic development of technology and the services offered, the global market has become quite confusing for both app developers and users.

The TAB innovation analysis gives an overview of different categorisation approaches as well as of the current technological and economic development trends with regard to health apps. In addition, it identifies points for debate in society, value orientations and political options for action serving as a basis for an assessment of innovation potentials.

Technological lines of development

The monitoring, measurement and evaluation of health data is not a fundamentally new phenomenon. Older methods include, for example, food diaries or weight trackers for recording the body weight over time.

For the increasingly widespread, ever more powerful smartphones and so-called wearables (small computers that are worn on the body like jewellery or clothing), software-supported options such as apps are available to record and evaluate health data quickly and conveniently – almost anytime and anywhere in everyday life. The novelty of health apps and their difference to previous social practices is mainly due to the continuous, automated and mobile collection and evaluation of health data. In addition, there are

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new possibilities for online linking to further, comprehensive health data and for visualising the data to provide the patients with knowledge that is quick and easy to understand. One of the innovative features of some health apps is that users can rapidly compare their data to the data of other users.

Concepts aiming at the future development of health apps can be found mainly in the fields of interoperability, artificial intelligence (AI) and cloud computing. In the context of promoting interoperability, open European and international standards such as the »Continua Design Guidelines« (CDGs) of the Personal Connected Health Alliance are of major significance. The CDGs specify the provider-independent acquisition of health-relevant data by means of various devices such as smartphones or blood glucose and blood pressure monitors as well as their transmission and exchange between end devices. Cloud computing services and AI systems increasingly support and extend the performance of health apps by performing data analysis and forecasting tasks. For this, personal data such as age, gender, weight and dietary habits are recorded and combined with current health-related data, e.g. the pulse, in an app and evaluated in order to provide users with an overall picture of their state of health and individual health tips, for example.

Economic lines of development

The development and distribution of health apps promote changing business models, but also completely new ones. The apps are usually offered via the respective stores, often free of charge or at low prices. Moreover, there is no verified and validated testing of the apps. Positive reviews of the apps by the users in the app stores usually force further sales and distribution of the apps. Thus, the apps will receive even more positive user reviews. Very often, the health apps are developed by young companies and start-ups, whereas the development environment is provided by the stores.

The business models are often based on a combination with complementary goods of the offering companies (e.g. in

the case of diabetes apps with a blood glucose monitor) or coupled with other, higher-level business models (e.g. financing through advertising). The data generated by means of the health apps are usually sent to the providers of

the corresponding devices and applications and stored centrally by them or third parties. At this point, quite a number of business models come into play and sell the stored data or the resulting profiles to data traders and other interested parties from the data industry.

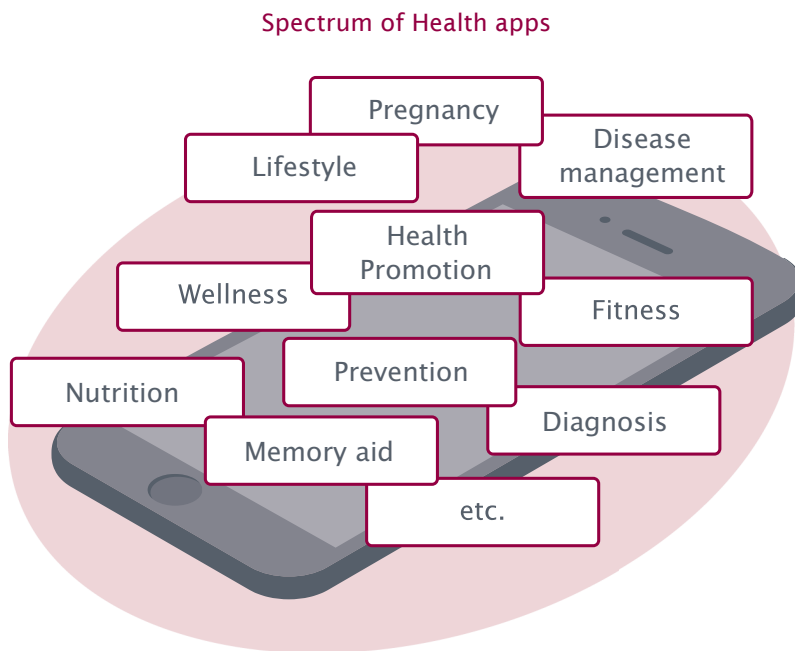
The economic potential of health apps lies in their ability to offer simple, easy-to-use everyday support options for health-related behaviour

to as many people as possible. Health apps often have a limited range of functions and can therefore also be used by less computer-savvy people. Against the background of demographic change, the target groups of health apps increasingly not only include people interested in sports and fitness, but also people with chronic diseases or health impairments. These target groups represent growing needs and thus a growing economic demand potential.

Like all other apps, health apps can be easily downloaded, tested and also deleted or simply no longer used. Often, users only try them and do not use them continuously. This is why developers and providers of the apps call into question their long-term economic return.

Apps in healthcare

The development trends reflect changing social contexts of use regarding health apps. This includes the integration of apps into preventive healthcare concepts. Thus, the purchase of fitness trackers or pedometers is subsidised by various health insurance companies. Moreover, bonus programmes are offered both in analogue and digital form and bundled via health apps. Some of the apps provide information about requirements and reimbursement premiums within the respective bonus programme, while others offer insured persons the opportunity to actively collect bonus points via the app.



Currently, the question of whether health apps have sufficient potential for supplementing standard healthcare services is still open. Besides the difficulties of placing apps on the primary healthcare market, the for-free mentality of users – i.e. the unwillingness to spend money on apps on the secondary healthcare market – inhibits the economic potential regarding the development or market launch of health apps. In Germany, the prevailing opinion is that digital products either should be for free or should be paid for by health insurance companies – otherwise, these apps would have no medical legitimacy. This fact is a major problem for start-ups with regard to the necessary refinancing of health apps.

Assessing the value and benefit of health apps from stakeholders' points of views

TAB's Stakeholder Panel TA is intended for promoting societal dialogue on the future needs of scientific and technological developments. Moreover, it shall particularly reveal societal value judgements that are linked to the development and use of new technologies and scientific findings.

Within the framework of the Stakeholder Panel TA, an online survey on the topic of health apps was conducted from September to December 2016, in which a total of 2,682 people participated. The data from 2,552 participants who answered at least 85 % of the questions were included in the evaluation.

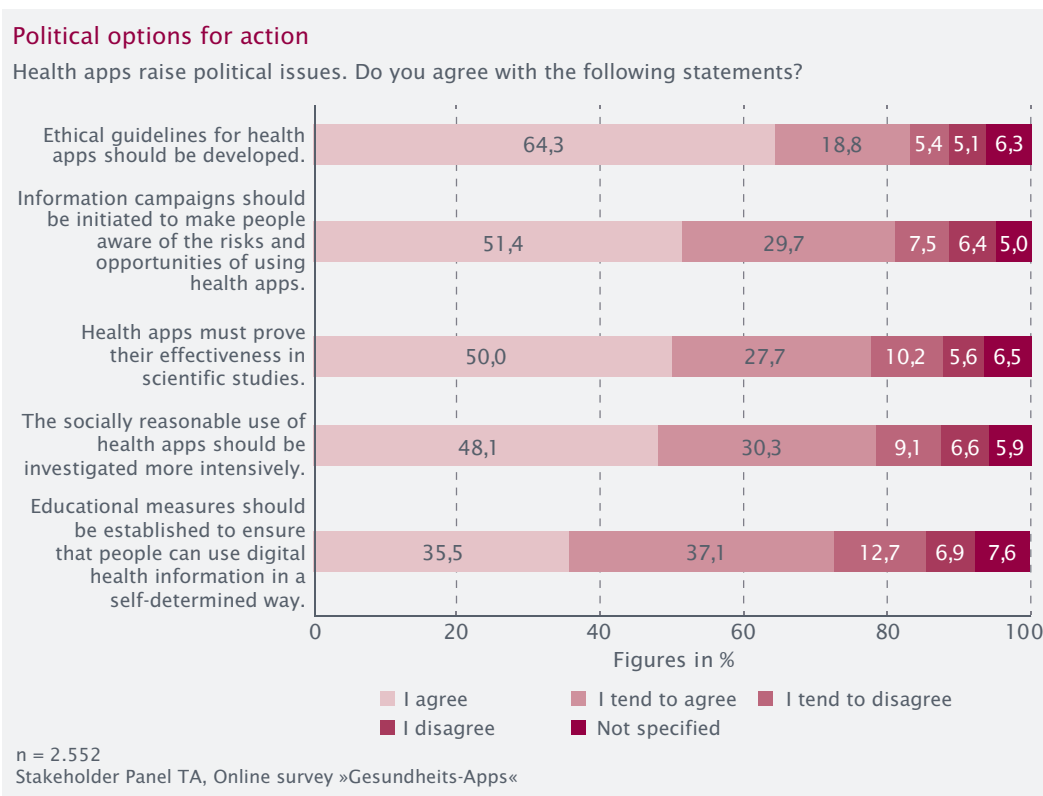
The evaluation of the online survey shows the following: More than half of the respondents use health apps. However, the frequency of use differs considerably and ranges from daily to monthly use. Altogether, the benefits of health apps are assessed in a very subjective way. Thus, apps that remind people to take their medication are rated as useful by almost two thirds of all respondents. About 60 % consider health apps that remind of appointments for vaccination and preventive medical check ups to be useful. Another 60 % quantify the benefit of apps that record and evaluate

physical activities (sports, exercise, etc.) and physiological parameters (heart rate, blood glucose, weight, etc.) as high or rather high. About two thirds of the respondents are of the opinion that health apps are a good way to encourage people to adopt a healthier lifestyle. However, if the data are used by third parties and allow conclusions to be drawn about people's health behaviour, health apps are generally rejected.

From the results of the survey, indications for socio-political fields of action can be derived. Thus, around 90 % of the respondents request binding standards for quality, data protection and data security. After all, 83 % are in favour of the development and use of health apps being accompanied by ethical guidelines.

Tapping the potentials of apps for health promotion – options for action

The scientific findings show that many people who use health apps lack digital and health literacy. Many users rely without critical reflection on the values collected or determined by



health apps, even if they are not calculated transparently and may show quality deficiencies. For this reason, the German Federal Government's promotion of instruments that provide guidance for the users of health apps and thus support the teaching of basic skills in dealing with health-related data or health apps seems to be called for.

Moreover, the results of the innovation analysis illustrate that – despite the fact that they are widely spread – there is a lack of reliable evidence regarding a preventive or health-promoting effect of the apps. There is also a lack of evidence as to whether and to what extent changes in behaviour triggered by health apps can be achieved not only in the short term, but also in the long term. The development of quality-related standards, including appropriate processes for quality assurance, could be initiated by (health) political institutions and stakeholders and supported by moderation with regard to their implementation. For this, the involvement of further stakeholders such as interest groups and associations, but also of providers and developers of health apps as well as of various selected user groups seems to be urgently needed. By analogy with the so-called Health Claims Regulation, quality-assuring evidence could also be required for health apps, e.g. by health-related specifications being based on and backed up by generally accepted scientific evidence.

One of the major fields of action is the improved protection of the health data collected or determined by health apps and becoming more and more valuable from an economic point of view. In principle, the already existing regulations with regard to data protection provide a good basis for the protection of personal health data. The main problem is whether the statutory provisions are implemented and complied with by the providers of health apps as well as whether and how these processes are controlled. In addition to the regulatory political institutions, particularly the providers and developers of health apps as well as the various interest groups – including consumer protection – should play an active role. This would be necessary and helpful in order to participate in an increased implementation of and compliance with legal regulations. Moreover, particularly in the context of health apps, targeted strategies for data protection and security should be given increased attention and reliably implemented. Expertise in this market-strategic field could foster the innovation capacity of companies or providers of health apps and prove to be a relevant competitive factor on the global markets.

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www.tab-beim-bundestag.de/en/research/u30000.html

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Last but not least, the results of the innovation analysis prove that the use of health apps is assessed ambivalently. Promoting societal dialogue and clarifying open questions can contribute to integrating societal interests, needs and values and making them available for use with regard to the further development of health apps. Moreover, there are still open issues to consider like, for example, the question of how much responsibility the individual should assume and is able to assume for his/her own healthy lifestyle, e.g. with regard to the avoidance of supernutrition, undernutrition or malnutrition. The dialogue could also aim at developing a monitoring model together with developers and providers of apps, but also with interest groups and users as well as stakeholders from (health) politics. This model should include appropriate instruments for an impact analysis of health apps and should be applied to obtain socially relevant suggestions for the development and design of apps which are innovative not only on the technical, but also on the social level.

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