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Title: Predicting the future of healthcare and eHealth with the Futures Wheel method

Year: 2020

Version: Published version

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Please cite the original version:

Kouri, Pirkko; Hopia, Hanna; Hakala, Anne. (2020). Predicting the future of healthcare and eHealth with the Futures Wheel method. Journal International Society Telemedicine eHealth, 8, e22 (1-6)

URL: <https://dx.doi.org/10.29086/JISfTeH.8.e22>

PREDICTING THE FUTURE OF HEALTHCARE AND eHEALTH WITH THE FUTURES WHEEL METHOD

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Abstract

By using information and communication technology (ICT), eHealth is a key enabler in improving healthcare, specifically its efficiency, productivity, quality, and patient satisfaction. Whilst eHealth applies technical developments to healthcare services, it is also about managing, finding, using, recording, and transmitting information to support health-related decisions. Moreover, eHealth encompasses a broad approach and commitment to improving healthcare through networking and co-operation. Thus healthcare providers need to have sufficient tools to predict and involve the possible futures of healthcare, specifically in the context of continuous eHealth development, implementation and innovations. This paper introduces the Futures Wheel (FW) method, describes the process for its use and some of its outcomes as a tool by which to achieve these goals. Based on experiences from over 60 FW working groups, the authors suggest that the FW method helps to see the possible futures of healthcare and eases the necessary adaptation inherent in eHealth. The FW method provides information and knowledge that professionals can utilise both to influence their future and to gain knowledge about alternative futures. The FW method is suggested for healthcare professionals who want to predict alternative futures of healthcare and eHealth in order to make important decisions that may have far-reaching consequences.

Keywords: eHealth; healthcare trends; Futures Wheel (FW) method; futures work; predicting the future

Kouri P, Hopia H, Hakala A. *JISfTeH* 2020;8:e22(1-6).

DOI: <https://doi.org/10.29086/JISfTeH.8.e22>

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Introduction

Futures studies, or futurology, is an increasingly mainstream social science approach that uses a variety of methods to systematically aggregate and analyse trends to examine what is 'likely to continue and what could plausibly change' in order to forecast possible futures. The future studies method has proved to be an excellent method for concretising co-operation in working life and for systematically collecting information on the future of working life. The method provides an overview of current and anticipated trends and the skills that people will require to optimally use and benefit from these. The development of innovative and up-to-date learning requires new ways of working, tools and learning environments. Learning can therefore be considered anticipation, so anticipation skills and future thinking must be the starting point of development work and part of all learning.¹⁻² One of the aims of futures studies in the context of healthcare is to systematically explore both possible and desirable futures and to improve decisions made by practitioners, managers, leaders, educators, policy makers and clients/patients.³ By examining different development paths, futures studies can describe multiple scenarios such as

current and new styles of ehealthcare processes and effects of digitalisation and help inform perceptions, alternatives and choices about the future.⁴ Indeed, healthcare providers need futures research to offer them a vision for their future work and work environments. Although the future is unpredictable, alternative futures, scenarios and possibilities can be described and anticipated. There are few methods which help healthcare providers to predict alternative futures for healthcare, particularly in the area of eHealth innovations and implementation.

Technology is an integral part of health science, with constant change and advancement. However, human factors will be one of the durable limitations of breakthroughs, and needed when anticipating future.⁵ It has been suggested that medicine and technology are entering an era called 'ITicine',⁶ showing the deep liaison between use of digitised technology, such as "caring machines," by patients/clients and healthcare professionals, also termed digital therapeutics (software driven, evidence-based, ICT to prevent, manage, or treat a disease or disorder).⁷ Caring machines refers to persons who cure themselves with the help of machines supported by ubiquitous computing.⁸ In Nordic countries, 'ITicine' healthcare is moving toward more patient-centric

care, enhancing patients’ participation in the healthcare process.⁶ Healthcare professionals could benefit from sharing their perspectives and views with others concerning futures work,⁶ requiring tools to help them anticipate and understand future changes and their implications.

The Futures Wheel method involves group discussion to build a vision of an agreed theme. It has been applied in different professional fields and disciplines, and some research has been published in the context of healthcare and healthcare education. For example, the method was applied to discover critical futures utilising a so-called “Think Tank” programme.^{9,10} With the help of an experienced facilitator, the participants questioned existing culture and manners and determined future healthcare scenarios. The method provided information about actions needed to build a preferred future over the next two decades. The actions defined were adoption of new technologies, better information collection and management, training and education programs, and, most importantly, attitudinal and cultural change. Futures methods have also supported the development of a regional plan to improve health outcomes and to make present health services more dynamic.¹¹ In workshops, participants described existing reality and then constructed a future of healthcare. The desired future was delineated in tight strategic alliances, education, inspiring technology usage, and taking better care of both older and younger people.¹¹ The futures method was also used to describe the perceptions of Finnish master’s students (social services and healthcare) about their future work and the competencies they will need in the future. The participants learned futures thinking which would, optimistically, be used in their studies and jobs.¹²

The purpose of this paper is to give insight into one Futures Studies method, the Futures Wheel. Although there

are several alternative approaches to designing and conducting the Futures Wheel (FW) method,¹²⁻¹⁴ multiple steps for one way to use the FW method in the healthcare context are presented, together with recognition of the strengths and limitations of the method. Between 2014 and 2018 the authors organised and conducted over 60 Futures Wheel workshops with groups from various professional fields. Some of these sessions focused on staff working in the fields of social services and healthcare. The approach taken to the process of presenting and analysing a session forms the basis for the paper.

Futures Wheel Method

Glenn^{13,14} developed the Futures Wheel (FW) method in the 1970s as a structured brainstorming method used for thinking about the future. It is a group work method in which the potential impacts on the future are arranged in circles around a wheel. According to Jackson¹⁵ the FW method produces a graphical visualisation of the direct and indirect consequences of a change or development, thereby encouraging participants to ‘think outside the box’. The wheel organises participants’ answers surrounding questions that go from strategic to operational. The questions are written in the middle of a piece of paper, and then small spokes are drawn wheel-like from the centre. Thus, the FW workshops function as tools for data collection and enhance learning and innovation among participants.¹²⁻¹⁴ In our workshops, we used an application created by Glenn.^{13,14} The process is presented in Figure 1, and key steps are further described below.

Preliminary work - Training the Facilitators

Each workshop had a facilitator who was responsible for coordinating the Futures Wheel workshop and leading the

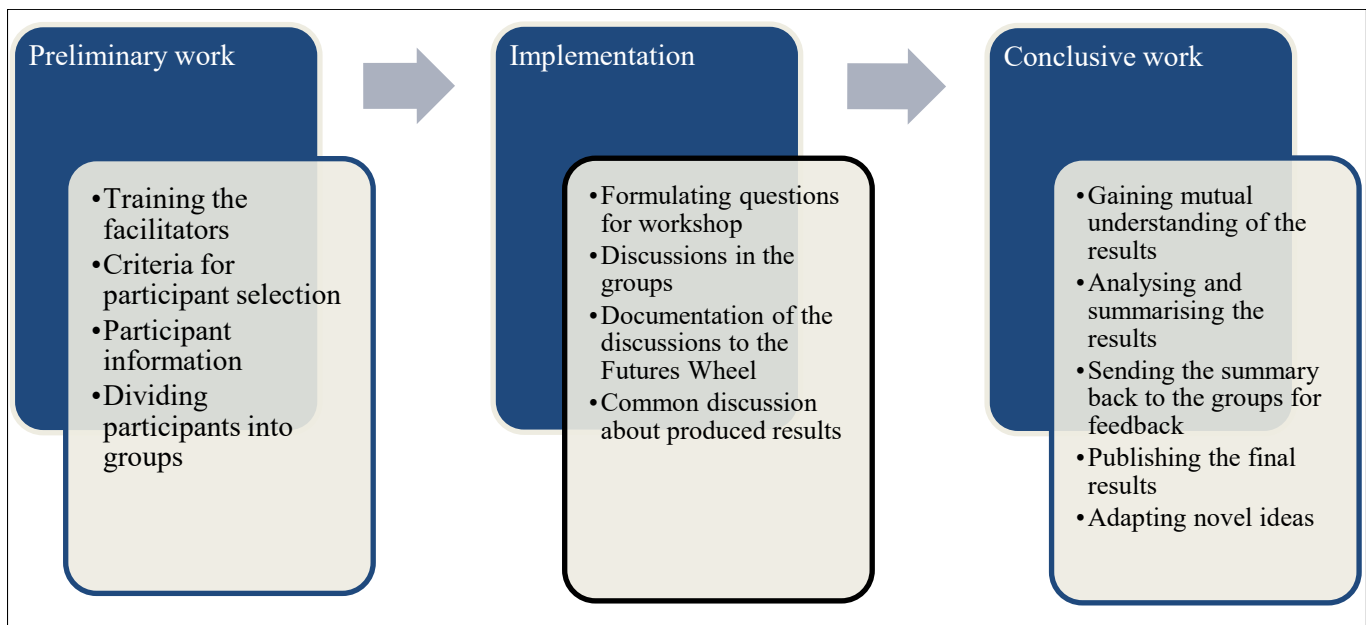


Figure 1. The Futures Wheel method.

group discussion. Their role was crucial in creating an innovative atmosphere for producing different possibilities of the future of healthcare and eHealth, and they were responsible for training participants to think about recent developments and potential future developments.

Although Glenn^{13,14} argued that successful facilitation required certain considerations, there was a limited description of the role and tasks of the facilitator who would be expected to guide participants in considering plausible futures and trends associated with healthcare and especially with the phenomenon of eHealth. Glenn noted that the facilitator would be a person who is familiar with thinking about the future and the Futures Wheel method and would use the guidelines of the method to help and lead participants in reflecting on the future regarding a specific content area. The facilitator would need to remain objective and neutral and would not take a particular position in the discussion. They would be responsible for assisting the group to achieve consensus on any disagreements that emerged during the workshop. Hence, the facilitator needed to know their own position(s) from the outset and guard against bias or conflicts of interest.¹⁶⁻¹⁸ Throughout the process, the facilitator had to keep the discussion focused on the future. These necessary skills, and the preferences and characteristics of the participants, were carefully considered prior to choosing the facilitator.

Implementation – Formulating Questions for the Workshop

Although many factors influence the future, weak signals or small changes at different levels can yield significant changes overall. Researchers have anticipated, identified and illustrated healthcare and education trends.¹⁹⁻²² In preparation for the Futures Wheel workshops the facilitators first studied research literature from different sources describing megatrends.²⁰⁻²² Healthcare megatrends that are likely to occur during the 21st century were identified as these will shape the sector for the next 10-15 years. Prior to the start of workshops, the trend options were selected, while recognising that local, regional and national changes are constantly altering the healthcare landscape.^{12,21}

After discussion by the facilitators, consensus was reached on a set of megatrends that would be used in the workshop. These were the polarisation, internationalisation, and digitalisation of healthcare services; ageing; and ecological soundness/sustainable development. These megatrends were used to stimulate different perspectives from participants. Recognising that the use of these megatrend labels might prevent the participants from considering other future scenarios, a “wildcard option” was also used in the workshop. The idea of the wildcard option was to inspire additional views on the future that went beyond the selected megatrends. According to Mohamed,²³ uncertainty phenomena are defined as randomness with unknowable probabilities. The wildcard option allowed for uncertainty phenomena. A blank sheet of paper was given to

the participants along with the five megatrends.

Based on the discussions and consensus on the megatrends, the facilitators then determined specific questions associated with the goals of the workshops. Three rounds of questions were used to achieve the goals. The questions were as follows: 1) What will the healthcare sector be like in 2025 and thereafter? 2) What new competencies would be required for the realisation of the future of healthcare and eHealth, given the identified megatrends? 3) How will the competencies be acquired? In the workshop, futures were considered for 2025 and thereafter.

Implementation: Facilitating Discussions and Documenting Discussion in the Future Wheel

The Futures Wheel method was described to the workshop participants and included descriptions of where the alternative futures produced by participants would be used.

The participants were asked to consider how the previously identified megatrends would affect the work in their field in 2025 and beyond. The selected five megatrends (polarisation, internationalisation, digitalisation of healthcare services, ageing, and ecological soundness/sustainable development) were introduced to the participants. After a thorough discussion among participants, they wrote their views and perceptions on the papers, which were then arranged by facilitators in the first circle of a Futures Wheel diagram. (Figure 2) The participants were asked to consider the competencies required of professionals in their own field for the realisation of the future described. After the group discussion, the competence descriptions were grouped in the second circle of the FW. The methods through which the requisite competencies would be acquired were then grouped in the third circle of the FW. Thus, the FW comprised three different circles using different colours to separate the circles. When all of the views were collected, the output was appraised by the group, and duplications were removed from the circles. With the help of facilitators, all participants then carried out an analysis of the views in order to gain mutual

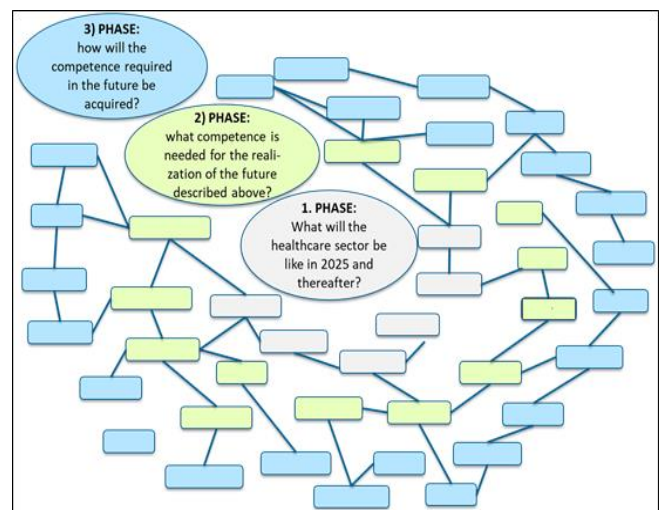


Figure 2. Futures Wheel method and circles.

understanding. Reaching consensus by the end of the process is crucial. The participants needed to be committed to finding consensus so that everyone involved could actively support, or at least live with, the outcomes.

Strengths and limitations of the Futures Wheel Method

The Futures Wheel method encourages the participants to transition from linear, hierarchical, and simplistic thinking to more network-oriented, organic, and complex thinking. The healthcare system covers different services (e.g., primary, secondary, and tertiary levels), facilities (e.g., hospitals, out-patient clinics, nursing homes, assisted living locations), and people (e.g., families, clients/patients and providers) that interact according to plan, sometimes non-regularly, and sometimes in an *ad hoc* manner. All of these elements in motion can cause unintended consequences such as adverse drug reactions or nosocomial infections. The unforeseen consequences raise the question of how regulations can be created to control the behaviour of a complex healthcare system in order not to deviate from a desired outcome.²⁴ The FW method can encourage an individual to develop a prospective perspective and response toward a future event, such as competence demands or client/patient expectations for care in the future. The FW method helps to organise thinking and questioning about the future.^{13,14}

Although Glenn¹³ claimed that the Futures Wheel method promotes a rapid, grass-roots consideration of the future, it is still necessary to discuss the soundness and trustworthiness of its outcomes. Two steps were taken to ensure the accuracy of the results. First, the whole procedure was carefully designed with the facilitators to create common rules and practices concerning the guidance of the workshop and the documentation of the views of the participants in different circles on the wheel. Indeed, Glenn^{13,14} recommended strictly following the guidelines of the FW method to prevent chaotic “intellectual spaghetti” that would make clear envisioning of the trend or event more difficult. Glenn¹³ further suggested using primary, secondary, and tertiary circles to prevent this problem and organise the associations among the items. These suggestions were followed in our workshop and three different circles were grouped to answer the specific questions associated with each of the megatrends.

Second, the facilitators carefully listened to all participants and, when items were placed on the wheel, any ambiguities were clarified. Moreover, the facilitator had to be aware of the perspectives or biases they brought to the workshop in order to dispassionately capture the possibilities suggested for the megatrends. Glenn also cautioned that a common mistake was to consider the ‘potential’ impacts or consequences as ‘true’ consequences and the actual reality.^{13,14} Therefore, the facilitator had to avoid making unsupported or premature judgements. In our workshops, a systematic procedure for each step was designed and implemented in this meticulous manner: five megatrends affecting the future were set as the starting points for the

workshops, all respondents were provided with the same information about the Futures Wheel method, and the facilitators were properly trained in use of the method. Using the selected megatrends as the participants’ starting point was justified as being widely recognised in the literature.²⁵⁻²⁸ The participants were also encouraged to use the wildcard option when there were things that surprised them or when alternatives to the proposed megatrends needed to be expressed.

Discussion

If future trends in healthcare and eHealth are not considered, then important opportunities for the development of appropriate, high quality services might be missed. Although the FW method is a rather simple technique for participants, requiring only paper and pen, a facilitator with motivation, and participants with productive minds transform it into a powerful tool for the exploration of the future. The method is a creative tool that generates and guides input for thinking about the future. As Gabriel stated, “The human brain is trained to anticipate future developments. We have the capability of mental time travel into the future, or the construction of alternate possible situations.”²⁹ Hence, we must use this capability to consider the future of healthcare and particularly the future of eHealth and its role in current and future development and implementation processes.

A flexible time frame can be helpful. Considering futures research, a fundamental question is “how far ahead is the future?” Passig³⁰ suggested that futures research should focus on five time-frames: the immediate range could be up to five years; a short range of five to ten years; a medium range of ten to thirty years; a long range of thirty to fifty years; and an extremely long range of from fifty to one hundred years.³⁰ However, uncertainty increases as we move away from the present and look further into the future.²³ Although a specific year as a fixed target was selected in the present case, not all studies use precise time ranges. For example, some consider the future as a moving target, where the behaviours and actions of people are synthesised;³¹ thus, there is no requirement to set a specific year in the future as a fixed target when performing futures research.

Based on the authors’ experiences, the Futures Wheel method provides several benefits for healthcare, and specifically eHealth. First, this method is quick, inexpensive and relatively easy to use. Data can be organised on the alternative futures within defined areas such eLearning and eHealth. The data collected using the FW method can be used for many purposes, such as the reformulation of job descriptions or requirements needed in evidence-based evaluation of eHealth interventions in future healthcare.

Many healthcare personnel, especially in Nordic countries, represent generation X, whose birth years range from the early-to-mid 1960s to the early 1980s. Such individuals are not ‘digital natives’ when compared to their

‘future colleagues’ from generations Y and Z who are considered globally connected and technological oriented. Therefore, structured methods like the Futures Wheel bring together older and younger professionals to grasp and describe eHealth phenomena. By sharing insights, views and perspectives, they can widen each other’s empirical knowledge base. Another benefit of using the FW method is understanding how predictions will influence planning and decision-making in healthcare systems, facilitating the role of healthcare professionals to participate in evidence-based decision making to inform patients, other experts and policy makers.^{2,5,6,29}

Even though there is no set of rules defining how to think about the future in a scientific manner,³¹ using well-planned forecasting techniques such as the FW method can help healthcare professionals make decisions that strengthen evidence-based practices and avoid ‘silo thinking’. The Futures Wheel method can also be used to encourage the healthcare workforce to view the future differently. eHealth, with its multi-professional workforce, can leverage such structured forecasting techniques for anticipating the future of eHealth in all of its capacities. Facilitators for the FW method should guide eHealth participants toward considering mobile, ubiquitous, personalised health using terms like availability, accessibility, acceptability and quality in order to see essential elements of eHealth.

Conclusion

eHealth, the use of ICTs for health, has been and continues to be disruptive technology, perhaps already reflecting elements of the ITicine. Human factors have been identified as a recurring barrier to eHealth initiatives and uptake, caused in part by lack of awareness and preparedness for new technology options and changes in work process and flow.⁶ Applying the Futures Wheel method may allow anticipation of eHealth induced change in healthcare. History has shown that the dissemination of eHealth is time-consuming and complex. Therefore, it is crucial to implement and evaluate methods that can predict the futures for eHealth.

When using the Futures Wheel method, one should be fully aware that thinking about the future using a systematic procedure means accepting that we cannot know the future. But the world is characterised by structural and dynamic complexities suggesting that illustrative thoughts, plausible explanations and alternative futures can and should be considered.^{21,24,31} The practice environment of future healthcare, incorporating eHealth, will be different from what exists today. Therefore, the method presented here could be very useful in viewing the future of eHealth from a rich variety of alternative perspectives. Overall, the FW method might encourage and support a prospective attitude of individuals toward future events, such as the identification and acquisition of the skills and knowledge needed in the development of eHealth technology and the use of its

applications. The authors strongly recommend that the FW method guidelines be thoroughly followed to further confirm the validity of the method. All of the points made in this paper should be taken as the basis for further discussion, and all rules for the FW method should be under continuous critical reflection.

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Conflict of interest. The authors declare no conflicts of interest.

References

1. Doz Y, Kosonen M. Embedding strategic agility a leadership agenda for accelerating business model renewal. Long range planning. *Int J StrategManag* 2010;43:370e382 DOI:10.1016/j.lrp.2009.07.006
2. Barber M, Donnelly K, Rizvi S. (2013). An avalanche is coming: Higher education and the revolution ahead. Paper published by the Institute for Public Policy Research. London, UK. Available at: https://www.ippr.org/files/images/media/files/publication/2013/04/avalanche-is-coming_Mar2013_10432.pdf accessed 12 December 2020.
3. Shekelle PG, Pronovost PJ, Wachter RM, et al. The top patient safety strategies that can be encouraged for adoption now. *Ann Intern Med* 2013;158(5 Pt 2):365–368. DOI: 10.7326/0003-4819-158-5-201303051-00001
4. Amara R. Views on futures research methodology. *Futures* 1991;2(6)3:645-649. DOI:10.1016/0016-3287(91)90085-G
5. Thimbleby H. Technology and the future of healthcare. *J Public Health Res* 2013;2(3):e28. DOI: 10.4081/jphr.2013.e28
6. Bushko RG. Strategy for the future of health: Goal formation and ITicine. *Stud Health Technol Inform.* 2009;149:3-18. PMID: 19745468
7. Wikipedia. (2020). Digital Therapeutics. Available at: https://en.wikipedia.org/wiki/Digital_therapeutics#:~:text=Digital%20therapeutics%2C%20a%20subset%20of,a%20medical%20disorder%20or%20disease accessed 13 December 2020
8. Bickmore T, Picard RW. Future of caring machines. *Stud Health Technol Inform.* 2005;118:132-145. PMID: 16301775

9. Bengston DN. The Futures Wheel: A method for exploring the implications of social–ecological change. *Soc Natur Resour* 2016 Mar 3;29(3):374–379. DOI: 10.1080/08941920.2015.1054980
10. Palmer J, Ellis N. Methodology for a think tank: the future of military and veterans' health. *Foresight* 2009;11(3):14–27. DOI: 10.1108/14636680910963918
11. Pryor W. From crops to care: The changing nature of healthcare in rural Australia. *J Futures Stud* 2014;18(4):119–130. DOI: 10.1.1.433.7276
12. Hopia H, Hakala A. Finnish social and health care professionals' perspective of the future. *Int J Healthcare* 2016;2(1):12–20. DOI: 10.5430/ijh.v2n1p12
13. Glenn JC. Participatory method. In J.C. Glenn and T.J. Gordon (Eds.). *Futures Research Methodology - Version 2.0*, AC/UNU. Washington: Millenium Project, DC, CD-ROM. 2002.
14. Glenn JC. The futures wheel. In Glenn JC, Gordon TJ (Eds.). *Futures Research Methodology - Version 2.0*, AC/UNU. Washington: Millenium Project, DC, CD-ROM. 2002.
15. Jackson M. *Practical Foresight Guide*. Chapter 3 – Methods 2013. Available at <http://www.shapingtomorrow.com/media-centre/pf-ch03.pdf> accessed 30 January 2019.
16. Apel H. *The Future Workshop*. Deutsches Institut für Erwachsenenbildung. 2004. Available at: www.die-bonn.de/esprid/dokumente/doc-2004/apel04_02.pdf, accessed 30 January 2019.
17. Jungk R, Mullert N. *Future Workshops: How to Create Desirable Futures*. London: Institute for Social Inventions, 1987.
18. Patton MQ. *Qualitative Research and Evaluation Methods*, (4th ed.). California: Thousand Oaks, Sage Publications, 2015.
19. Hauptman A, Sharan Y. Foresight of evolving security threats posed by emerging technologies. *Foresight* 2013;15(5):375–391. DOI: 10.1108/FS-05-2012-0036
20. Greengard S. *The Internet of Things*. Cambridge, MA: MIT Press, 2015.
21. Hajkovic D, Cook H, Littleboy A. *Our future world. Global megatrends that will change the way we live. The 2012 revision*. Canberra: CSIRO. 2012. DOI: 10.4225/08/584ee9706689b
22. WHO. *Synthesis Paper of the Thematic Working Groups. Health Workforce 2030. Towards a Global Strategy on Human Resources for Health*. World Health Organization 2015. Available at: http://www.who.int/hrh/documents/15-295Strategy_Report-04_24_2015.pdf?ua=1/ accessed 30 January 2019.
23. Mohamed K. How futurists look to uncertainty phenomena? *Int J Soc Sci Humanity Stud* 2013;3(1):79–82. DOI: 10.7763/IJSSH.2013.V3.199
24. Amer M, Daim T, Jetter A. A review of scenario planning. *Futures* 2013;46:23–40. DOI: 10.1016/j.futures.2012.10.003
25. Lipsitz L. Understanding healthcare as a complex system. The foundation for unintended consequences. *JAMA* 2012;308(3):243–244. DOI: 10.1001/jama.2012.7551
26. Sitra. (2020). *Megatrends 2020*. Available at: <https://www.sitra.fi/en/topics/megatrends/> accessed 11.12.2020.
27. Göll E, Evers-Wölk M. (2014). *Meetings and conventions 2030: A study of megatrends shaping our industry*. Available at: https://www.researchgate.net/publication/277199067_Meetings_and_conventions_2030_A_study_of_megatrends_shaping_our_industry accessed 13 December 2020.
28. Deloitte.(2016). *Health Care Foresight. Identifying megatrends*. Available at: <https://www2.deloitte.com/content/dam/Deloitte/sg/Documents/life-sciences-health-care/sg-lshc-healthcare-foresight-megatrends.pdf>, accessed 13 December 2020.
29. Gabriel JA. Scientific enquiry into the future. *Eur J Futures Res* 2013;2:31. DOI 10.1007/s40309-013-0031-4
30. Passig D. Future-time-span as a cognitive skill in future studies. *Futures Res Quart* 2004;19(4):27–47. Available at: https://www.passig.com/sysvault/docsfiles1/FUTURE-TIME-SPAN_AS_A_COGNITIVE_SKILL_IN.pdf accessed 30 January 2019.
31. Brier D. Marking the future: a review of time horizons. *Futures* 2005;37(8):833–848. DOI: 10.1016/j.futures.2005.01.005