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Policy with Foresight

Preparing for the future in a scientifically rigorous and actionable way

Using anticipatory methods in policy should start with identifying the specific question and timeframe for which insights are needed.

It is fundamental to assess which anticipatory methods can paint the kind of "bigger picture" often needed in long-term policy planning.

The outputs of anticipatory methods depend on having relevant and robust data. Consider whether the available data suffice to carry out the chosen method. Are further data needed?

Anticipatory methods are a process rather than a one-time assessment. Update and improve the data and/or models throughout the policy cycle.

Think about the audience – what type of output will be most accessible for them?

Transdisciplinary collaboration is vital for carrying out accurate and helpful anticipatory assessments. Different perspectives across disciplines and sectors widen the scope of what is known about the future.

POPULATION EUROPE

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Introduction

Policymaking is becoming increasingly fast-moving, with challenges more global and interrelated. Societal shocks, such as the COVID-19 pandemic and geopolitical changes, have made it clear: policies must be versatile, forward-thinking, and responsive to future changes.

This creates a need for anticipatory methods, such as foresight and forecasting. These methods can help inform policy action and increase societal resilience to crisis and change. Robust data along with the right combination of methods are needed to address questions about future developments.

The recommendations in this Policy Brief are based on the assessments of leading foresight and forecasting experts, who shared their expertise in a workshop in November 2023 as part of the "Policy Lab" of the EU-funded research project Towards a Resilient Future of Europe ("FutuRes").

The following pages will brief policymakers on what to consider when using anticipatory methods in the policy cycle, including the benefits and limits of different approaches. This brief also provides examples of how different anticipatory methods can be used to answer different policy challenges and how these methods can be effectively combined.

The brief contains four "Building Blocks" to consider when using anticipatory methods for policy. It provides an orientation for policymakers who wish to engage with the future in a scientifically rigorous and actionable way.

Seven steps for using anticipatory methods to support policy making

as described by Fabiana Scapolo
Head of Unit Demography, Migration & Governance at the EU Commission's Joint Research Centre

1. Understand the policy demands
First, policymakers should clearly define the policy challenges and questions for which anticipatory insights could be helpful. The definitions must be understood by those who will carry out the research.

2. Engage in an anticipatory analysis
Experts in anticipatory methodology can then choose the combination of methods which will best address the policy challenge as well as best manage uncertainty (please see Building Block 1).

3. Develop strategic foresight
Based on the scenarios and/or projections produced, policymakers can draft strategies. It is important to find a balance between broader strategies and concrete actionable plans. The role of the researchers here is to provide recommendations.

4. Translate foresight into policy planning
At this stage, policymakers can ensure that the insights are woven into the fabric of policy development. The challenge for researchers is to provide tangible results that are comprehensive and accessible.

5. Define potential for tangible policy change
The most important obstacle which both researchers and policymakers have to bridge, is the gap between anticipatory insights and action. Strategic foresight can help show pathways to overcome resistance to change, for example when implementing preparation for future crises.

6. Implement policy with foresight
Once a concrete policy is implemented, policymakers can ensure its effectiveness by seeking further anticipatory assessments, which can help anticipate the implications of future changes to the policy.

7. Evaluate Policy
Policymakers and researchers must continue working together to ensure that updated anticipatory insights can support evaluations and adjustments in a timely manner.

Building Block 1: Face the risk – Dealing with uncertainty when anticipating the future

To prepare policies for the future means to engage in an exercise of risk management. Of course, no anticipatory methods can lay out a 100 percent accurate vision of the future. Rather, the art is to face uncertainty productively and to communicate what is known and unknown in a clear and honest way. Identifying the different types of uncertainty in an analysis is critical for tailoring policy responses.

What is uncertainty? How can it be dealt with?

In statistics and economics, the term uncertainty refers to residual doubt or imperfect information on a situation or outcome. Risk is a type of uncertainty – in colloquial speech, the two words are often used interchangeably. A rule of thumb is: as uncertainty increases, predictability declines.

Some types of uncertainty can be reduced, others cannot. For example, if uncertainty stems from the lack of (reliable) data or problems in a model, there is potential for it to be reduced. However, uncertainty is irreducible if it results from the fact that the future is unforeseeable and cannot be pre-determined or controlled. For example, systemic shocks, such as political changes or the COVID-19 pandemic, can disrupt anticipated scenarios considerably. This type of irreducible uncertainty is still very important. For transparency and due diligence, information about uncertainty must be clearly communicated alongside the forecasts or other statements about the future.[1]

Jakub Bijak is a Professor of Statistical Demography at the University of Southampton. His research focuses on demographic uncertainty, population and migration models as well as forecasts of the demography around armed conflicts. Professor Bijak led the Horizon 2020 project Quantifying Migration Scenarios for Better Policy ("QuantMig"), which focused on various aspects of quantitative migration scenarios and forecasting. He now continues his research within the FutuRes project.

Prof. Bijak explains that in contrast to long-term demographic trends like ageing, migration can change rapidly because it is influenced by so many factors. How, then, can we make use of modelling to help decision makers prepare and adapt, even when events are virtually unforeseeable? After the so-called "asylum crisis" of 2015–16, European policymakers have been looking to better anticipate migration trends on a large scale. Specifically, they want to be able to detect trigger points, identify where migration starts to diverge from its past trends, and to establish early warning systems for when potential change points occur. At the "FutuRes Policy Lab" workshop, Professor Bijak used the example of migration to illustrate what it means to deal with uncertainty in the context of anticipatory methods.

"Even though in the context of migration predictability is generally very limited, we are making progress. For example, in the QuantMig project, by combining newer forms of digital data with more traditional data such as macro-economic indicators, we could identify some advance signals about possible upturns in asylum migration."

Jakub Bijak, Professor of Statistical Demography, University of Southampton

In migration, we can currently describe future trends as "barely predictable", with the limits of predictability in numerical terms being merely a few years (at most, a decade) into the future. However, this differs greatly depending on which type of migration one is talking about. The QuantMig project confirmed that migration related to forced displacement is subject to extremely high levels of uncertainty – which in turn means low predictability. Migration driven by family reunion or the return of nationals, on the other hand, is subject to relatively less uncertainty, making it more predictable – and therefore, theoretically easier for policy planning.

However, if we want to look the longer-term, we gradually move out of the area of forecasting and into a need for policy that can react to the unforeseen, simply by being adequately prepared. The challenge is not only to identify concrete trends, but also other possible scenarios, and then to plan policy responses. This is the realm of foresight studies in the broader sense.

Both the QuantMig and FutuRes projects find that we can explore the multitudes of futures through a manageable number of possible scenarios – by analysing migration trends of the past and imagining the possible changes that are still yet to happen. One way of building scenario assumptions is to look at the frequency with which events of a certain magnitude have occurred – for example, once or

twice in a decade. Even if events or trends were relatively small in the past, it is still important to include them in anticipatory methods to assess their possible trajectories. This approach opens the possibility to model and quantify even very uncertain scenarios, which can help policymakers prepare for the unexpected.

Recommendations for managing uncertainty in your policy planning:

Employ a rigorous risk management approach from the beginning. Understand the limits of anticipatory methods and work with experts who know the levels and types of uncertainty in the context you want to assess.

Be clear about the scope and horizon of your anticipatory needs. Predictability varies greatly depending on the type of policy field and the time horizon. Use a suitable methodical approach – early warning, forecasting, or foresight – that matches your specific requirements.

Adjust data and methods to your objectives and test them. The outputs of quantitative projection modelling can be "stress-tested" by using different assumptions. They can also be checked for robustness against theory or other methods: are the results still plausible?

Focus on what is possible and be transparent about what is not. No anticipatory method will be 100% certain – be honest about the limits of the methods and the outputs, and focus on where uncertainty can be reduced.

Building Block 2: Multiply your options – Qualitative Scenario Building

While always taking uncertainty into account, it can be valuable to generate different possible future "scenarios" for which policy planning and action is needed. The anticipatory method of Qualitative Scenario Building increases the scope of possible futures, and thus works to decrease the risk of the unthinkable occurring without warning. In this way, it complements traditional forecasting, which focuses on predictions based on existing statistical trends.

Qualitative Scenario Building involves several methodical stages. It usually begins with a large-scale analysis of contextual material (often software-supported) and consultations with specialists about the topic or theme being analysed. By compiling scientific sources with specialised literature from websites, social media and press, recurring hypotheses about the future are identified.

The recurring themes are then evaluated by experts from policy, science and business, and/or by focus groups composed of civil society actors (such as those potentially affected by change or crises). The remaining themes are narrowed down to those that are likely to be the most impactful. Finally, a scenario (or multiple scenarios) are written in a narrative style which is accessible to the target audience. This process includes detailed descriptions of the main factors as well as estimates of the likelihood of the different scenarios.

The method has gained significance in the context of the increasing focus of European governments, the European Commission and international actors on "anticipatory governance".[2] All have engaged with some variation of Qualitative Scenario Building in recent years, because when implemented correctly, this approach is recognized as helping to foresee future developments and to direct preparatory measures. This can result in better adaptation to change and increased societal resilience.

"The goal of qualitative scenario building is to identify possible futures. In doing so, we can anticipate events better and then implement preparation measures accordingly."

Marlène de Saussure is a member of the FutuRes project and an expert in qualitative scenario building at VDI/VDE Innovation and Technology.

One example of how Qualitative Scenario Building has been recently used in the policy context is when FutuRes project partner VDI/VDE Innovation and Technology ran a "Scenario Building Process" for the Federal Ministry of Labour and Social Affairs in Germany.[3] The Ministry was interested in possible scenarios for how the country's workforce will develop by 2040. Well aware of future demographic trends affecting the labour market, the policymakers sought knowledge about the future development of citizens' values, expectations and fears around work.

Through focus groups, expert interviews, and literature and qualitative data analysis, the foresight team identified drivers and effects of social and technical innovations at work – at both the societal and individual level. In close collaboration with the Ministry, the team then set-out several possible future scenarios along with possible pathways for policy development for each one.

What are the advantages of Qualitative Scenario Building?

It facilitates in-depth exploration of potential futures. Incorporating multiple forms of knowledge (e.g. from experts and non-specialists with lived experience) in an exploratory way can reveal a range of possibilities that may not be identified through other methods.

Longer-term perspectives are imaginable. Foresight considers different influencing factors from across society and typically allows for the identification of scenarios relatively far into the future.

There is compatibility with traditional forecasting methods. It can be supported by quantitative data and/or be combined with forecasting methods for holistic perspectives on the future that are firmly rooted in evidence, yet creative in scope.

It is a bottom-up and participatory process. Relevant knowledge and expertise from across society is incorporated and valued. This allows for insight into societal developments and trends.

What are the limits?

A scenario is not the same as a prognosis, nor is it a policy recommendation. The purpose of the method is to understand possible changes in the future. However, results must be translated into operational policy measures for dealing with these changes.

Recommendations for engaging with this method:

Ensure a grounded transition from strategic insights to operationalisation. Those carrying out a Qualitative Scenario Building analysis should work closely with the people who will need to develop policies to address the possible futures identified. What are concrete policy approaches and implications of the different outcomes?

Building Block 3: Simulate the future (and repeat)

Once there are policy options and/or different future scenarios to consider, it is possible to test where they would lead. One way to test the likely short-to long-term impacts of policy is to use microsimulation models.

Andreas Höhn is a health data expert and a researcher at the University of Glasgow, working on the Systems Science in Public Health and Health Economics Research project ("SIPHER"), funded by the United Kingdom's Prevention Research Partnership (UKPRP). During the FutuRes Policy Lab workshop, he discussed how microsimulation models can help shape responses to current policy challenges, such as the consequences of austerity, the aftermath of the COVID-19 pandemic, and the cost-of-living crisis on people's health. Microsimulation is a system science methodology, which means it aims to capture interrelated trends and factors – rather than to analyse them in isolation.

Data on individuals and households required to build microsimulation models are often not readily available. In these cases, experts can create a synthetic population: a "digital twin" that represents the population of a given territory. Such a data set can be created by feeding survey data and aggregate-level population statistics data into a statistical model. Depending on the information used to inform this process, the resulting "digital twin" can be representative even for small-area levels and with respect to variety of factors relevant for research questions – such as sex, age, education, employment or housing conditions.

With this method, the SIPHER project is testing the likely outcomes of policy measures to fight child poverty in Scotland. One policy explored is the Scottish Child Payment: a financial boost of £25 per week provided by the Scottish Government to support eligible families at risk of poverty with children under 16 years of age. Both researchers and governmental stakeholders collaborate throughout this research, which seeks to assess (1) whether the policy can help to reduce child poverty, and (2) whether the policy has a positive impact on parents' mental and physical health.

Systems adapt and reorganise, and individuals might not behave as predicted. It is therefore likely that there will never be a final state of any system, including no clear end to the impacts of policies and crises. This means that it is also important to "stress test" the results of simulations to improve their accuracy, and to update and to reimplement the models along with the latest data and contextual factors throughout the policy cycle.

"We need data sources and models that allow us to understand complex real-world settings – ideally before we are making decisions. Synthetic populations and microsimulations can help us to achieve the required systems perspective when approaching today's challenges."

Andreas Höhn, University of Glasgow, SIPHER Consortium

What is the advantage of microsimulations?

They allow for examination of the possible outcomes of very specific policy interventions. Even small amendments such as changing eligibility or extending a policy can be tested, as well as the likely effects at the level of individuals and households. This means that they can capture how effects of policies play out across different population subgroups and be aggregated to reflect changes for an entire population.

Microsimulation models can be developed based on a variety of data sources. The range spans from strictly safeguarded administrative registers to less restrictive surveys and synthetic population data sets.

Where are the limits?

Translating between policy and the microsimulation models can be challenging. Building microsimulation models require the translation of policy questions into measurable indicators (e.g. income) and associations (e.g. impact of income on diet/nutrition across population subgroups). Likewise, outputs of microsimulations ultimately should provide insights that are actionable for policymakers.

A microsimulation model is not a policy manual. The role of the scientist is to offer knowledge and easy access to developed data, models and results. However, policy decisions must be made by the elected officials.

Recommendations when engaging with microsimulations:

Establish and maintain clear dialogue between modelers and policy makers. Check in regularly to ensure that models represent the reality of all stakeholders. This means that a consensus is required, for example with respect to the time frame captured, or the issues being analysed. Transparency is needed with respect to how a model was built and the data sources used as inputs. Communicating the limitations of the data and models is also essential context when presenting a model's outputs.

Building Block 4: See how it might play out – Game-based scenarios to test resilience

Another layer of anticipatory policy work is to use game simulations to "test" the implications of different possible futures. This narrative-approach involves having people act out scenarios together, including the reactions and decisions they would make in such situations as different stakeholders. This method can build on scenario narratives and simulation models by revealing new and unexpected ideas and constraints. It also allows policymakers to engage "first hand" with potential future scenarios and the consequences of different policy options.

Game simulations are meant to lead to constructive conversations, in which people collaborate in long-term thinking about possible futures, but they are also an opportunity for institutions to prepare for possible crises. Guy-Philippe Goldstein, who is an expert in game simulation models and who has worked with the French Ministry of Defence along with several large corporations to implement this methodology, cites the example of Korea's response to COVID-19 pandemic.

In comparison with other countries, Korea is viewed to have handled the virus outbreak relatively successfully. At the beginning of the pandemic, the country was able to slow the spread of the coronavirus without the government imposing large-scale and strict lockdowns and overwhelming health facilities. Korea also had a much lower rate of total confirmed COVID-19 deaths per million population than other countries. One reason that Korea had more effective crisis management in this situation, says Mr. Goldstein, is because in 2019 officials had carried out simulation exercises and training for what to do in the case of such a pandemic.

"Instead of simply reading through possible scenarios that could play out in the future, engaging in simulation games can help anticipate how different actors across society will be impacted and how best to respond."

Guy-Phillippe Goldstein, consultant specialising in game simulation methodology

The embodied nature of this methodology can also serve as a communication strategy and inspire policy action, as stakeholders gain appreciation for the projected scenarios and the impacts. Taking on the roles and perspectives of others can also bring different parties closer to "speaking the same language" about issues and possible ways forward. This can ultimately lead to more thoughtful and timely policy planning and action, and thus contribute to societal resilience.

The European Commission's Joint Research Centre has developed a "Scenario Exploration System"[4] ("SES") that

is geared at policy makers, but allows anyone to try such game simulation exercises. "Players" can stimulate engagement with stakeholders in any policy area by engaging in the role of business, policymaker, civil society, the public or the media. Policy topics for which the SES has been applied include: the possibilities for the recycling of fishing nets worldwide, nutrition challenges in the future, possible transition pathways to climate neutral economies, and options for sustainable city planning.

What are the advantages of game simulations?

They can promote policy action. It can increase understanding of (a) the scope and development of risks and (b) the limitations of current policies, ultimately incentivising more proactive policy action.

Trying it out first. Game simulations can help policy makers explore the implications of different policy options and the impacts of crises or other developments.

New options can arise. Acting through future scenarios can reveal insights that were not identified through quantitative anticipatory methods.

Where are the limits?

Game simulations are not for making predictions! They do not provide quantifiable outcomes or a level of predictability for different scenarios.

Recommendations when engaging with game simulations:

Preparation and debriefing are essential. A game is tantamount to a laboratory experiment: the clearer the definition of the hypothesis being tested, the better the experimental process to test it. Also, like in any laboratory experiment, there must be thorough debriefing and analysis of what happened during the simulation exercise to fully extract useful insights.

The set-up must be focus on exploring interesting conversations and questions. Through constructive critique and counter-pitching of different approaches and proposals, small groups identify new issues and themes.

Select the right "players". They must be ready "to play": to immerse themselves in the subject matter, to play the role of an agent (actor, organisation, etc.), and to be in an uncertain situation where they may fail.

Definitions: Methods for looking into the future

There is different terminology which refers to looking into possible futures for the purpose of policy design and adaptation. In this brief, we use "anticipatory methods" as an umbrella term.

The primary reason for the lack of one single definition is that the methods have overlaps. All of them make use of "traditional" as well as "non-traditional" sources of data[5] and can be informed by both quantitative and qualitative methodologies. Nevertheless, there are distinguishing factors to keep in mind:

Forecasting: This approach typically uses quantitative methods to numerically predict shorter-term trends into the future. Projections and simulations are often associated with this approach.

Foresight: This approach tends to be exploratory and rely more on qualitative methods. It involves looking at longer-term strategies and possible outcomes. Scenario-building, horizon scanning and game-based scenarios can be part of foresight.

Early Warning Systems: Early warnings focus on identifying trigger points that require action to adapt and reduce risk. They may be devised from a combination of forecasting and foresight.

There is no "superior" tool or approach when it comes to anticipatory methods. Certain approaches address specific questions better than others or are suited to different stages of the policy cycle. Resilience-building policy design will likely benefit from a combination of several methods.

Conclusion

Anticipatory methods are central to the EU-funded "FuTuRes" project, which runs from 2023 to 2025. With its transdisciplinary team of academic and non-academic partners, the team will produce new insights on the drivers and implications of ageing throughout people's lives and how they intersect with crises and resilience.

The FutuRes experts are developing projections and possible scenarios – likely futures, using some of the methods described above. The project will also look at how policies could be developed so that individuals of all ages can become better prepared for crises and unexpected shocks: whether this be an individual crisis (e.g. unexpected exposure to unemployment, illness, or loneliness) or a societal crisis (e.g. inflation, mass displacement, or natural catastrophes). The collaboration with external stakeholders, through the FutuRes Policy Lab, aims to boost the impacts of this work.

"The FutuRes Policy Lab will reach out to stakeholders and policymakers in order to ask them what we need to take into account when we proceed with our research."

Arnstein Aassve, Professor of Demography, Bocconi University, Milan and Principle Investigator of the Project "FutuRes – Towards a Resilient Future of Europe"

Find out more about the FutuRes Project and get in touch:
Web: https://futu-res.eu/
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Footnotes

[1] In the context of migration, this distinction has been championed in the European Union's Horizon 2020 research and innovation programme-funded project Quantifying Migration Scenarios for Better Policy ("QuantMig"). For more information, please see the project's "White Paper on Migration Uncertainty: Towards Foresight and Preparedness": https://population-europe.eu/research/discussion-papers/white-paper-migration-uncertainty

[2] For one example, please see: OECD. (2021). Foresight and Anticipatory Governance in Practice – Lessons in effective foresight institutionalisation: https://www.oecd.org/strategic-foresight/ourwork/Foresight_and_Anticipatory_Governance.pdf

[3] Das Werkheft 05: Wie werden wir künftig arbeiten? Arbeitsgesellschaft 2040. Denkfabrik Digitale Arbeitsgesellschaft, Bundesministerium für Arbeit und Soziales, 2022: https://www.denkfabrik-bmas.de/schwerpunkte/arbeitsgesellschaft-2040/das-werkheft-05-wie-werden-wir-kuenftig-arbeiten

[4] Please see the EU Joint Research Centre's Scenario Exploration System here: https://knowledg4policy.ec.europa.eu/foresight/tool/scenario-exploration-system-ses_en

[5] Traditional data refers to data from government registers, surveys, censuses, and so on, whereas "non-traditional data" includes data such as social media analytics, synthetic population datasets or geolocated mobile phone data.

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