

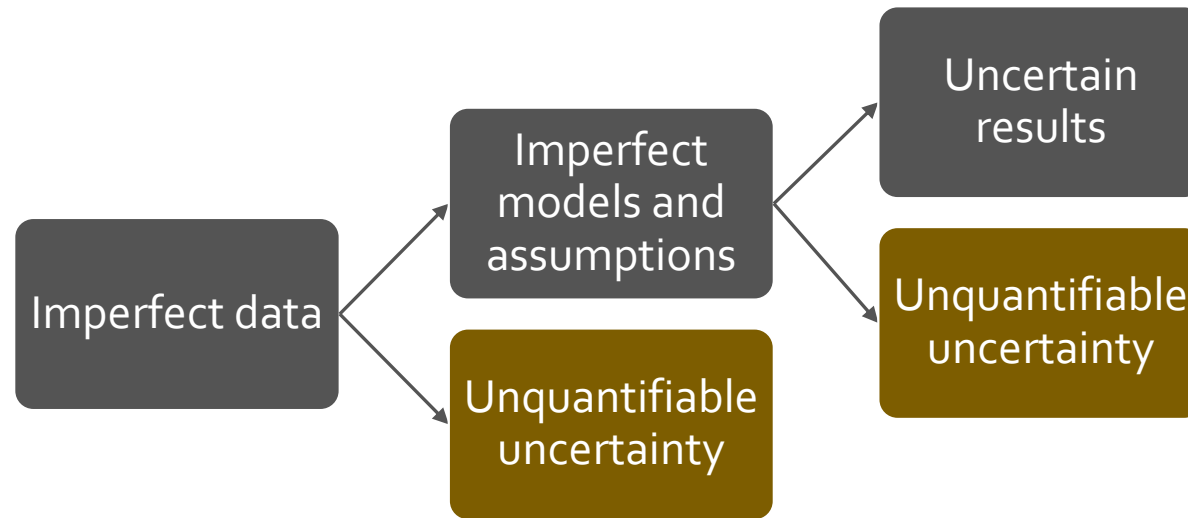
# UNECE Task Force on Population Projections

Preliminary recommendations and  
good practices:  
Uncertainty

Eurostat-UNECE Work Session on Demographic Projections  
Geneva, April 20<sup>th</sup> 2016

# Uncertainty

- Uncertainty touches all aspects of the production of population projections



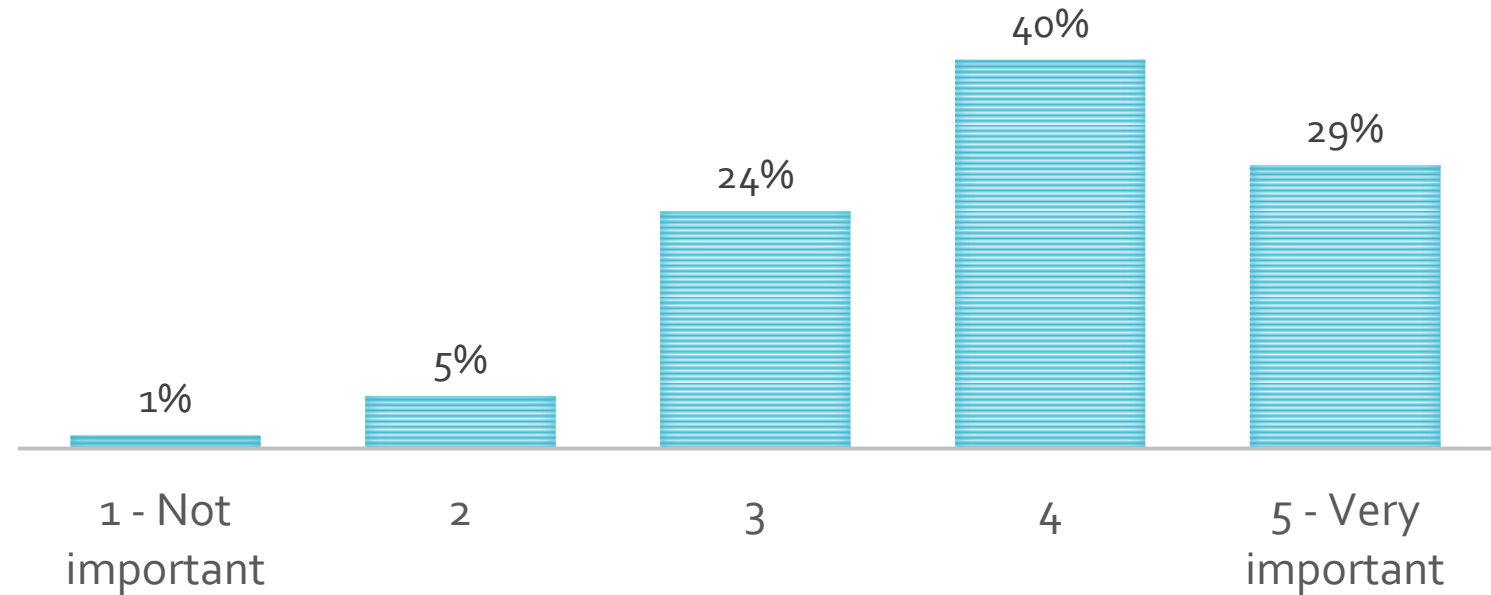
Uncertainty

Motives for  
communicating it

- A requirement of science communication
- A key factor in decision making
- Users want it to be communicated

### USER SURVEY

PLEASE RATE THE IMPORTANCE OF THE QUANTIFICATION OF THE UNCERTAINTY OF THE PROJECTIONS IN REGARDS TO YOUR USE OF POPULATION PROJECTIONS (N=148)

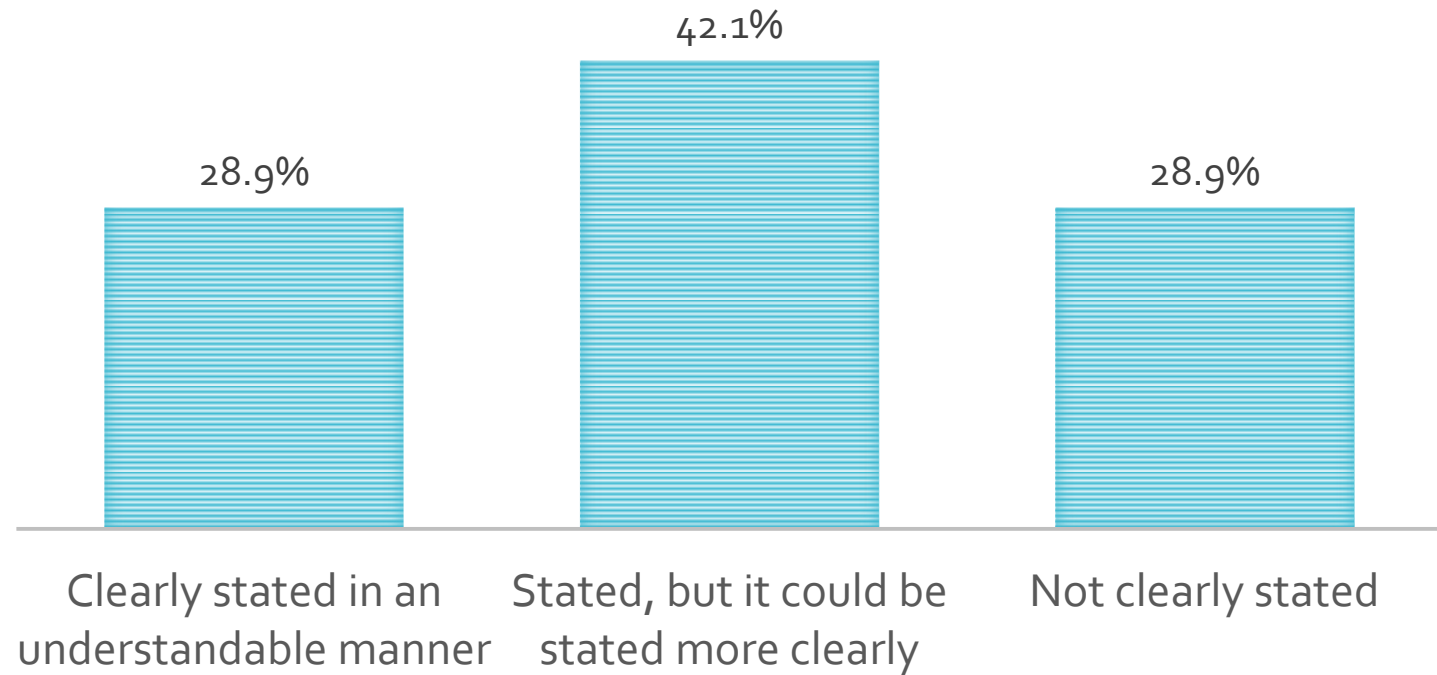


Uncertainty

Motives for communicating it

## USER SURVEY

IN YOUR OPINION, THE UNCERTAINTY OF THE PROJECTION IS:  
(N=119)

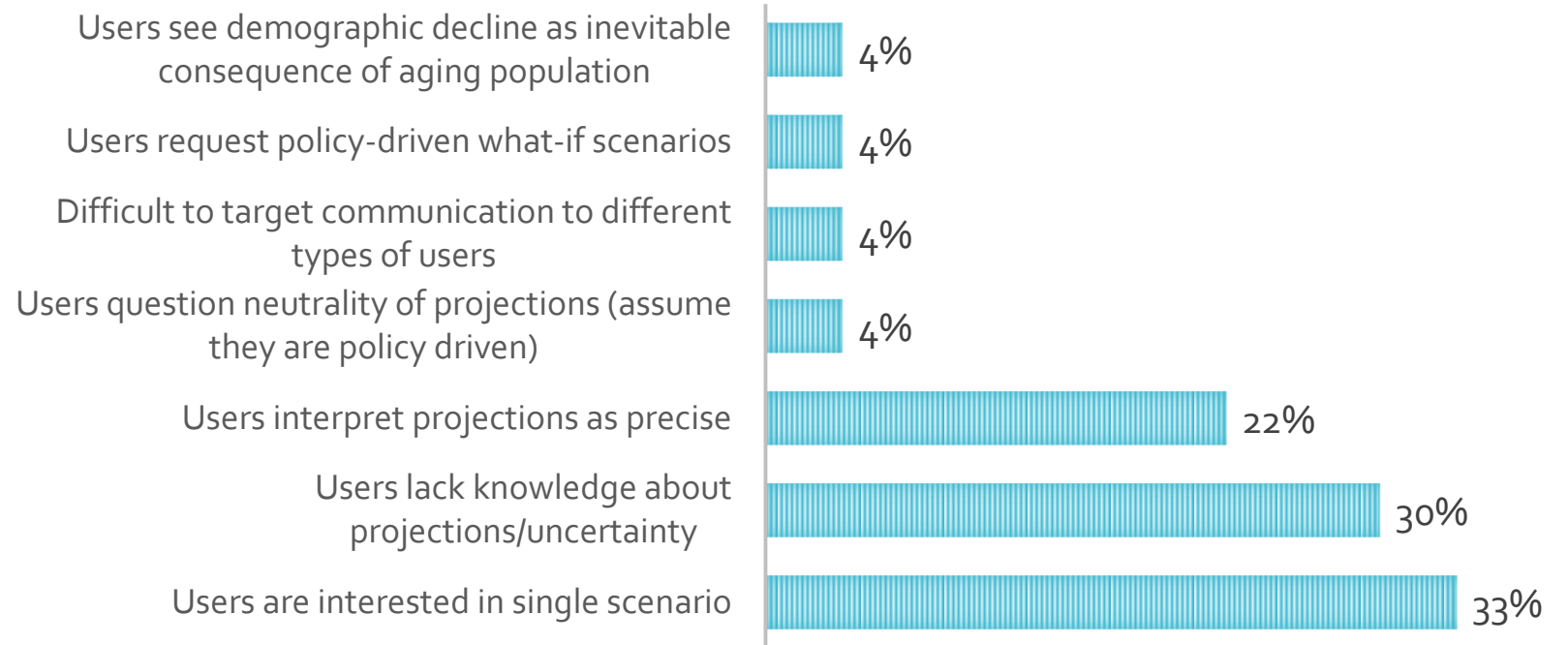


Uncertainty  
Motives for  
communicating it

## NSO SURVEY

IN YOUR OPINION, WHAT CHALLENGES DO YOU ENCOUNTER IN COMMUNICATING THE UNCERTAINTY OF POPULATION PROJECTIONS TO USERS (FOR INSTANCE, DO PROJECTION USERS HAVE ANY COMMON MISCONCEPTIONS ABOUT THE PROJECTIONS)?

N=27



# Uncertainty

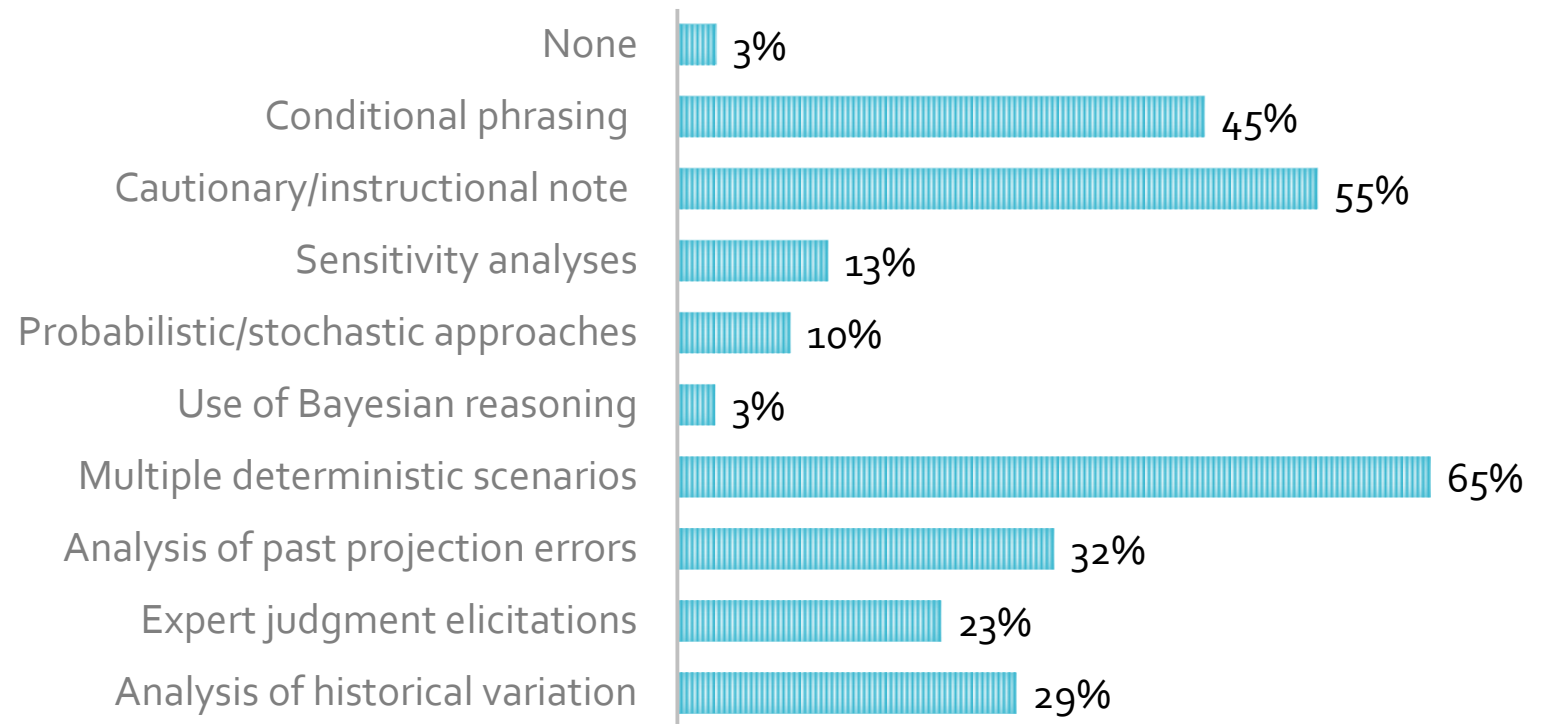
# Motives for communicating it

# Uncertainty

## Current practices among NSOs

### NSO SURVEY

IN YOUR DISSEMINATIONS, DID YOU USE ANY OF THE FOLLOWING METHODS TO COMMUNICATE THE UNCERTAINTY OF PROJECTIONS TO USERS? INDICATE ALL THAT APPLY. N=31



Key  
recommendation  
1

- **Address uncertainty explicitly**
  - Uncertainty touches on essentially all aspects of communicating population projections



Key  
recommendation  
1

1. Clearly state the uncertain nature of projections in high-level dissemination materials
2. Help users understand uncertainty and its interpretations on a deeper level
3. Pay particular attention to written expressions of uncertainty
4. Consider and acknowledge major sources of uncertainty
5. Solicit and publish expert opinion

Uncertainty

Good  
practices

KR: Address  
uncertainty  
explicitly

1. Clearly state the uncertain nature of projections in high-level disseminations
  - Short, accessible and frank discussion
  - How it impacts interpretation of results
  - Increases its chances of being picked up by lay audiences and journalists
  - Examples from NSOs

# Uncertainty

Good  
practices

KR: Address  
uncertainty  
explicitly

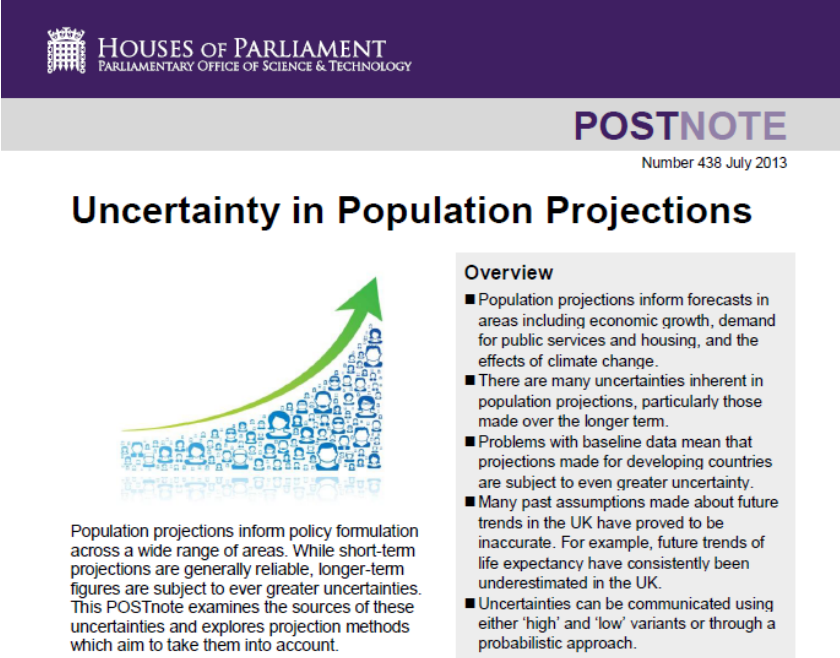
2. Help users understand uncertainty on a deeper level
  - Dedicated section of dissemination material
  - Aim to educate users on how to understand uncertainty in more depth

Uncertainty

Good  
practices

KR: Address  
uncertainty  
explicitly

- An example of specific communication on the topic of uncertainty



**HOUSES OF PARLIAMENT**  
PARLIAMENTARY OFFICE OF SCIENCE & TECHNOLOGY

**POSTNOTE**  
Number 438 July 2013

## Uncertainty in Population Projections

**Overview**

- Population projections inform forecasts in areas including economic growth, demand for public services and housing, and the effects of climate change.
- There are many uncertainties inherent in population projections, particularly those made over the longer term.
- Problems with baseline data mean that projections made for developing countries are subject to even greater uncertainty.
- Many past assumptions made about future trends in the UK have proved to be inaccurate. For example, future trends of life expectancy have consistently been underestimated in the UK.
- Uncertainties can be communicated using either 'high' and 'low' variants or through a probabilistic approach.

Population projections inform policy formulation across a wide range of areas. While short-term projections are generally reliable, longer-term figures are subject to ever greater uncertainties. This POSTnote examines the sources of these uncertainties and explores projection methods which aim to take them into account.

<http://researchbriefings.files.parliament.uk/documents/POST-PN-438/POST-PN-438.pdf>

Uncertainty

Good  
practices

KR: Address  
uncertainty  
explicitly

3. Pay particular attention to written expressions of uncertainty
  - Avoid complicated terminology
  - Describe ranges of results rather than single estimate
  - Use conditional phrasing
  - State divergences of judgements in regards to main assumptions or events that can influence the results
  - State how a given results could change given variations in demographic trends or unexpected events (e.g. population ageing could be robust but could be lessened given higher fertility).

Uncertainty

Good  
practices

KR: Address  
uncertainty  
explicitly

4. Consider and acknowledge all major sources of uncertainty
  - Related to data
    - Base population
    - Data used for the assumption-building and parameterization
  - Related to the future
    - Emergence of new policies, changes in vital rates, etc.
  - Structural
    - Lack of scientific knowledge
    - Limitations of the modeling process
  - Regularly evaluate the strengths and weaknesses of the projection program in regard to sources of uncertainty

## Uncertainty

Good  
practices

KR: Address  
uncertainty  
explicitly

5. Solicit and publish expert opinion
  - Note divergences in judgments and associated arguments/justifications
  - Be transparent about the elicitation process, possible biases/challenges
    - i.e. human difficulty in estimating probability

Key  
recommendation  
2

- Provide a range of results
  - In order to reflect the uncertainty of projections.



Key  
recommendation  
2

1. Disseminate several scenarios or variants
2. Consider attaching probabilities to the projections

Uncertainty

Good  
practices

KR: Provide a range  
of results

## 6. Disseminate several scenarios or variants

- Some benefits:
  - Relatively easy to implement
  - Relatively easy to communicate to users
  - Useful to guide potential interventions or policy development

Uncertainty

Good  
practices

KR: Provide a range  
of results

6. Disseminate several scenarios or variants
  - Some drawbacks that should be made explicit to users
    - Implausible correlations among components
    - Convergence of some indicators across scenarios (e.g. low- and high-growth scenarios)
    - Lack of internal consistency

Uncertainty

Good  
practices

KR: Provide a range  
of results

6. Disseminate several scenarios or variants
  - Should be guided by a comprehensive strategy
    - Carefully designed sensitivity analysis should be provided for a variety of indicators, e.g. provide combinations showing uncertainty for various types of results (population sizes, age indicators, etc.).

Uncertainty

Good  
practices

KR: Provide a range  
of results

## 7. Consider attaching probabilities to the projections

- Benefits:

- Probabilistic interpretation
- Possibility to produce custom intervals
- Potentially more internal consistency

- Limitations:

- Complexity
- Prediction interval is also a forecast
- Difficult to interpret prediction intervals

Uncertainty

Good  
practices

KR: Provide a range  
of results

7. Consider attaching probabilities to the projections
  - NSOs should weigh benefits with additional resources required
    - Precise measurements of uncertainty should be provided only when robust data and methods are available
  - It should be made very clear what the prediction intervals refer to
  - Users should be made aware of the limitations
    - Prediction intervals forecasts
    - Not all sources of uncertainty are considered