Social inclusion in the world of modern predictive analytics

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Abstract 1/2

- The volume of digital data is increasing by around 61 % annually.
- The rapidly developing techniques of predictive analytics make it possible to use this data in underwriting and pricing of insurers.
- These novel technologies present huge opportunities for societies to utilize pooling of risks better and better.
- For insurers better techniques help not only to cover risks more efficiently but also to better manage adverse selection and moral hazard, and also to combat insurance fraud.

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Abstract 2/2

- With these benefits we also have threats.
  - Does increasingly exact risk–based underwriting lead to a decrease in the inherent solidarity, existing not only in mandatory or social insurance but also in voluntary insurance?
  - Do we end up in a situation where lack of insurance leads to a larger part of the population being socially excluded (recognizing that modern techniques, when used responsibly, can also reduce exclusion)?
- This presentation looks at the problem of avoiding social exclusion in the context of evolving techniques.
- It is connected to the thinking of the Consultative Expert Group on Digital Ethics set up by EIOPA, where the author was chairing one of the three workstreams.

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EIOPA = European Insurance and Occupational Pensions Authority

Social inclusion/exclusion and protecting vulnerable individuals/groups?

- A **vulnerable person** is either a minor or someone who, for physical or mental reasons, is unable to look after him-/herself or his/her finances.

- **Social exclusion** or **social marginalisation** is the social disadvantage and relegation to the fringe of society:
  - the process in which individuals are blocked from, or denied full access to, various rights, opportunities and resources that are normally available to members of a different group, and which are fundamental to social integration, e.g. housing, employment, healthcare, civic engagement, democratic participation, and due process.

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Alienation or disenfranchisement resulting from social exclusion

- Exclusion often connected to
  - social class,
  - race,
  - skin color,
  - religious affiliation,
  - ethnic origin,
  - educational status,
  - childhood relationships,
  - living standards, and/or
  - political opinions, and appearance.

- Such exclusionary forms of discrimination may also apply to
  - people with a disability,
  - minorities,
  - LGBTQ+ people,
  - drug users,
  - institutional care leavers,
  - the elderly and the young.

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Consequences of exclusion

- Anyone who appears to deviate in any way from perceived norms of a population may thereby become subject to coarse or subtle forms of social exclusion.

- The outcome of social exclusion is that affected individuals or communities are prevented from participating fully in the economic, social, and political life of the society in which they live. This may result to resistance in form of demonstrations, protests, or lobbying from the excluded people.

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What is insurance – two possible ways to understand insurance?

Two ways to understand insurance have existed through the whole history of insurance

- Insurance can be understood as a product sold by wealthy institutions or individuals to cover financial consequences of realised risks covered by an insurance contract, or

- Insurance can be understood as a mechanism where a community of insureds agrees to mutually cover large risks encountered by few members of the community, by paying premiums ex ante or ex post

- These aspects exist in all insurance also today – irrespective of whether we talk of insurers as mutuals or limited companies

Solidarity in insurance – insurance & society

- Insurance always contains a certain amount of solidarity – already in the idea of those few suffering a loss getting compensation from the many who fared better
- The idea of (private/voluntary) insurance is that all the insureds pay a premium corresponding correctly to their risk – in this sense there is no solidarity, however
  - There can be unintended solidarity when premiums etc. are calculated based on uncertain or incorrect data
  - There can be intended solidarity when certain data (e.g. gender) is not used because of legislation or other considerations (like corporate social responsibility)

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Some negative results of insurance solidarity

- Adverse selection
  - Less than exact underwriting can lead to less risky insureds to refrain from taking insurance
  - To avoid the results of adverse selection essential cover can be made compulsory/statutory insurance (a certain degree of help can be achieved through community tariffing)

- Insurance fraud
  - Insurance is always vulnerable to claims based on fake reporting, but also to cover granted based on intentionally untrue data

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Essential & non-essential insurance

- Depending on the jurisdiction concerned, different types of insurance are more or less essential when we talk of vulnerability – criteria mentioned already before:
'individuals are blocked from, or denied full access to, various rights, opportunities and resources that are normally available to members of a different group, and which are fundamental to social integration, e.g. housing, employment, healthcare, civic engagement, democratic participation, and due process'

What modern data science and artificial intelligence mean for social exclusion?

- The four V's (Volume, Velocity, Veracity and Variability) of Big Data connected to advanced analytical methods make it possible to categorise individuals in increasingly advanced ways,
    - often creating problems, see e.g. 'Weapons of Math Destruction' by Cathy O'Neill
- Problems are often intentional, but as actuaries we should recognise also unintended and erroneous situations where the models used are wrong, e.g., because correlation is thought to mean causality

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Checklist for actuaries developing data solutions (1/3)

- Did you carry out a fundamental rights impact assessment where there could be a negative impact on fundamental rights? Did you identify and document potential trade-offs made between the different principles and rights?

- Did you ensure an adequate working definition of "fairness" that you apply?

- Did you establish a strategy or a set of procedures to avoid creating or reinforcing unfair bias, both regarding the use of input data as well as for the algorithm design?

Inspired by the Independent High-level Expert Group On Artificial Intelligence Set Up By The European Commission, 2019

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Checklist for actuaries developing data solutions (2/3)

- Did you ensure a mechanism that allows others to flag issues related to bias, discrimination or poor performance?

- Did you ensure that your system accommodates a wide range of individual preferences and abilities?

- Did you take the impact of your system on the potential user audience into account (e.g. essential vs. non-essential insurance)?

- Did you consider a mechanism to include the participation of different stakeholders in the system's development and use?

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Checklist for actuaries developing data solutions (3/3)

- Did you pave the way for the introduction of the system in your organisation by informing and involving impacted workers and their representatives in advance?

- Did you assess the broader societal impact of the system's use beyond the individual (end-)user, such as potentially indirectly affected stakeholders?

- Did you ensure that the social impacts of the system are well understood? For example, did you assess whether there is a risk of job loss or de-skilling of the workforce? What steps have been taken to counteract such risks?

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Conclusions

- Actuaries, due to their education and code of conduct, are well-placed to develop responsible, innovative, advanced and reliable ways of using modern data analytics to the benefit of our communities

- Actuaries need to be careful as the techniques present, along with great opportunities, grave threats

- Actuaries should always check their models so that they foster social inclusion, say with the checklist provided in this presentation

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