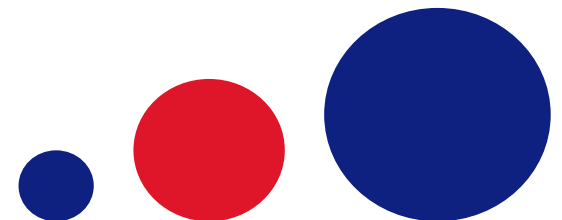




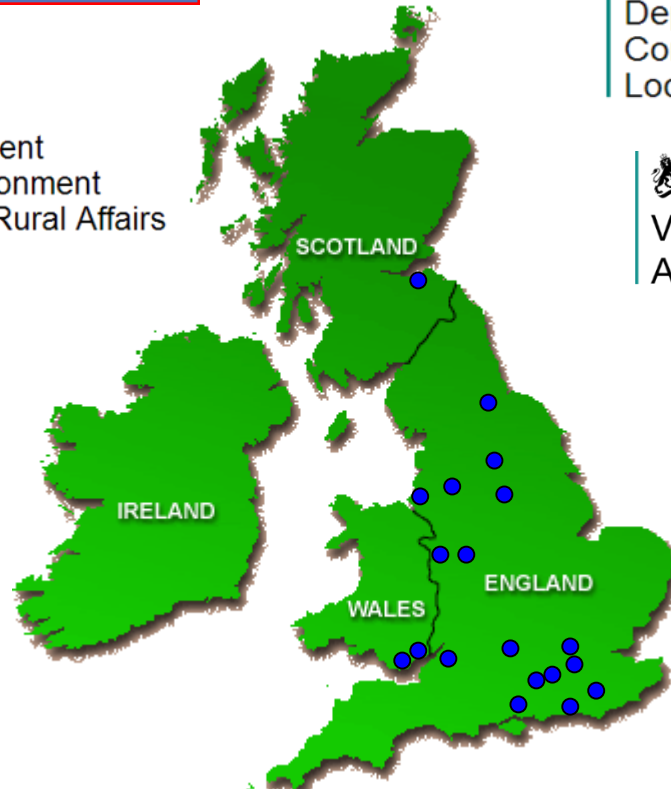
**G**OVERNMENT **O**PERATIONAL **R**ESearch **S**ERVICE

# **Government Operational Research and Assessing Impact**

**Presentation to EWG-POR, École  
polytechnique, 15 February  
Howard Turner (GORS)**



# Where are we (700 of us)?

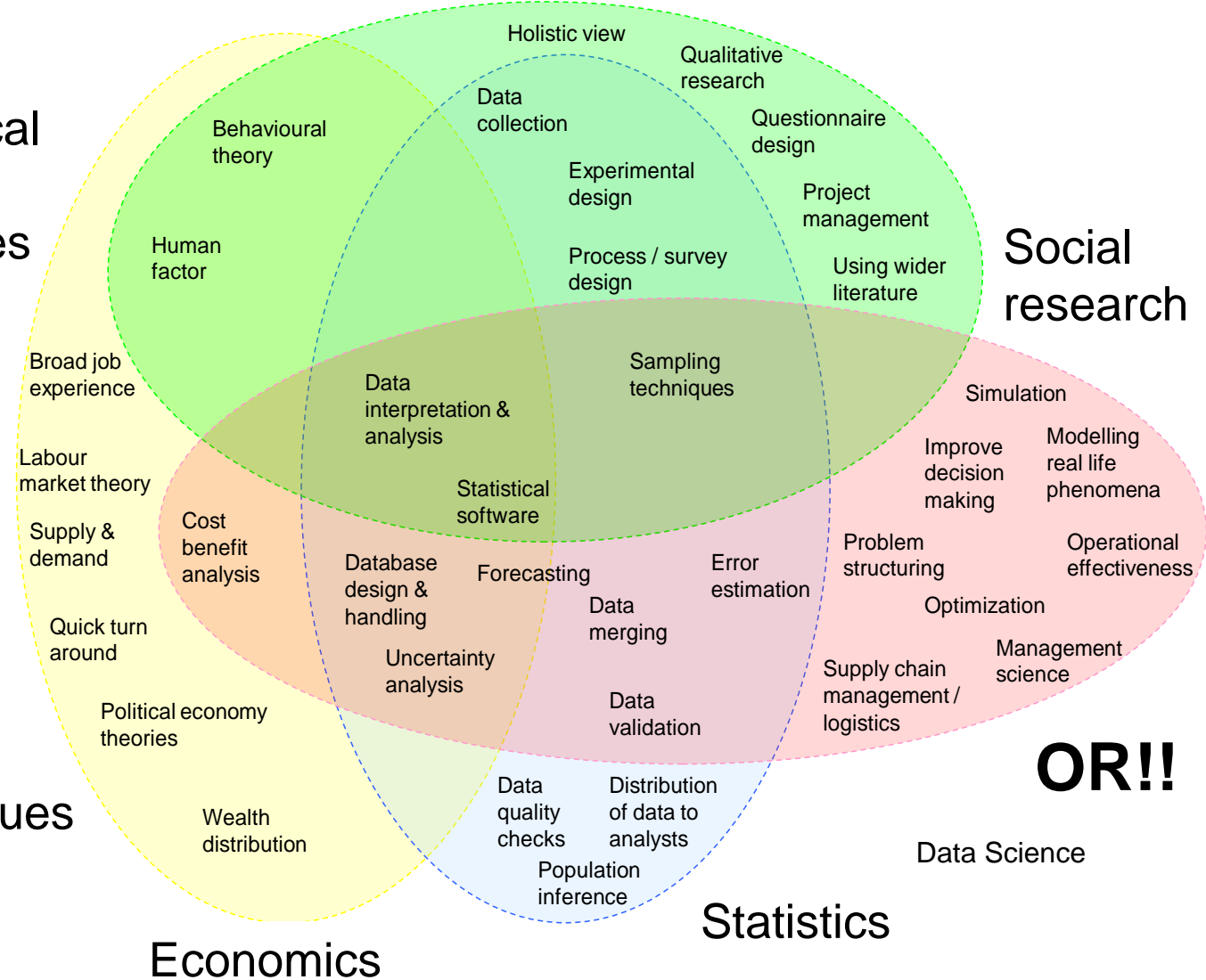


These are some of the departments employing GORS members, including those with the largest analytical groups. OR analysts are also employed in other departments and agencies.



# Analytical professions: An OR view

- We are the analytical minds informing Government policies
- Professions complement each other
- We might work as part of large multi-profession teams, or with operational colleagues



# GORS case study: forecasting

- **Department of Health needs to ensure blood supply meets demand**
  - Short shelf life
  - Need to optimise to minimise costs and wastage
- **GORS analysts forecast demand by identifying underlying drivers**
  - Demographics and health of population
  - Changes in number of procedures per 100,000 population requiring blood
  - Changes in average blood use per procedure
  - Challenges: obtaining, cleaning, verifying data!
- **Also modelled movement of blood in hospitals**
  - Identify possible cost savings
  - Provide evidence and incentives for change



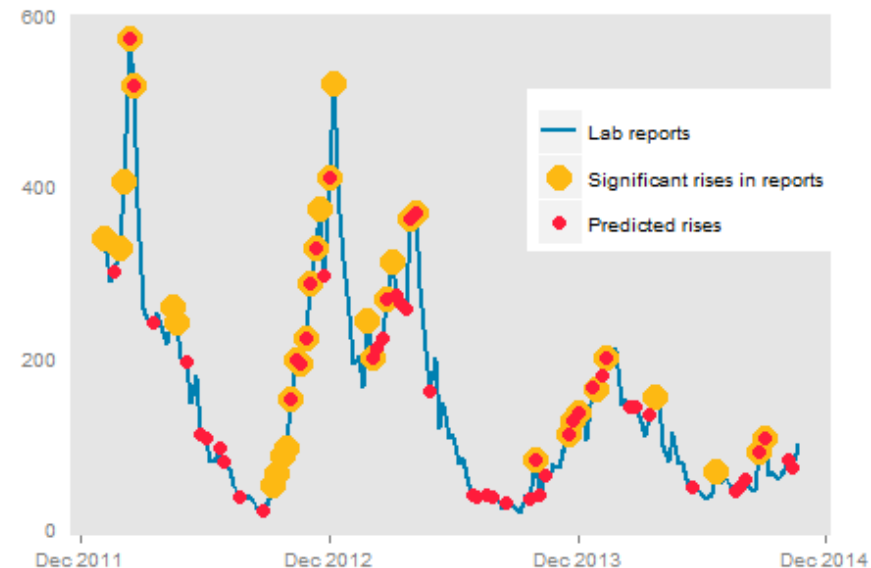
# GORS case study: data science

- **Food Standards Agency want early warning of Norovirus outbreak**
  - When cases are rising (not peaked)
  - Launch targeted intervention, with NHS
- **GORS analysts used data mining and modelling**
  - Obtained 3 years of data from Twitter and lab reports
  - Build model to predict probability of outbreak from Tweets
  - New cross-team collaboration!



wintervomitingbug  
upsetstomach  
sicknessbug  
sick  
norovirus diarrhoea  
vomit puke  
stomachvirus  
wintervirus  
vomit AND virus

To reduce false positives, require three positives in a row



# Assessing impact

- Successful projects, but:
  - What's the counterfactual?
  - Was this the right project?
  - Did the right people see it?
  - Was it high-profile?
  - Was it implemented?
  - Etc, etc
- Difficult
  - Perhaps impossible?



# Napoleon 1er

- 1804: Napoléon 1er donne à l'École son statut militaire et sa devise : « Pour la Patrie, les Sciences et la Gloire ».
- 1813:

20256. — AU GÉNÉRAL COMTE LEMAROIS,  
GOUVERNEUR DE MAGDEBURG.

Dresde, 9 juillet 1813.

Je reçois votre lettre du 6 juillet, par laquelle, vous m'écrivez : « Ce n'est pas possible », m'écrivez-vous : cela n'est pas français. Je suis dans le content de votre lettre, mais je ne puis que vous dire que les bateaux chargés d'avoine pour les chevaux de la Garde, qui se meurent. Cette avoine sera remplacée par ce qui arrive dans le pays, par la récolte qui est prochaine, et, enfin, par ce qui est envoyé de la 32<sup>e</sup> division.

D'après la minute. Archives de l'Empire.



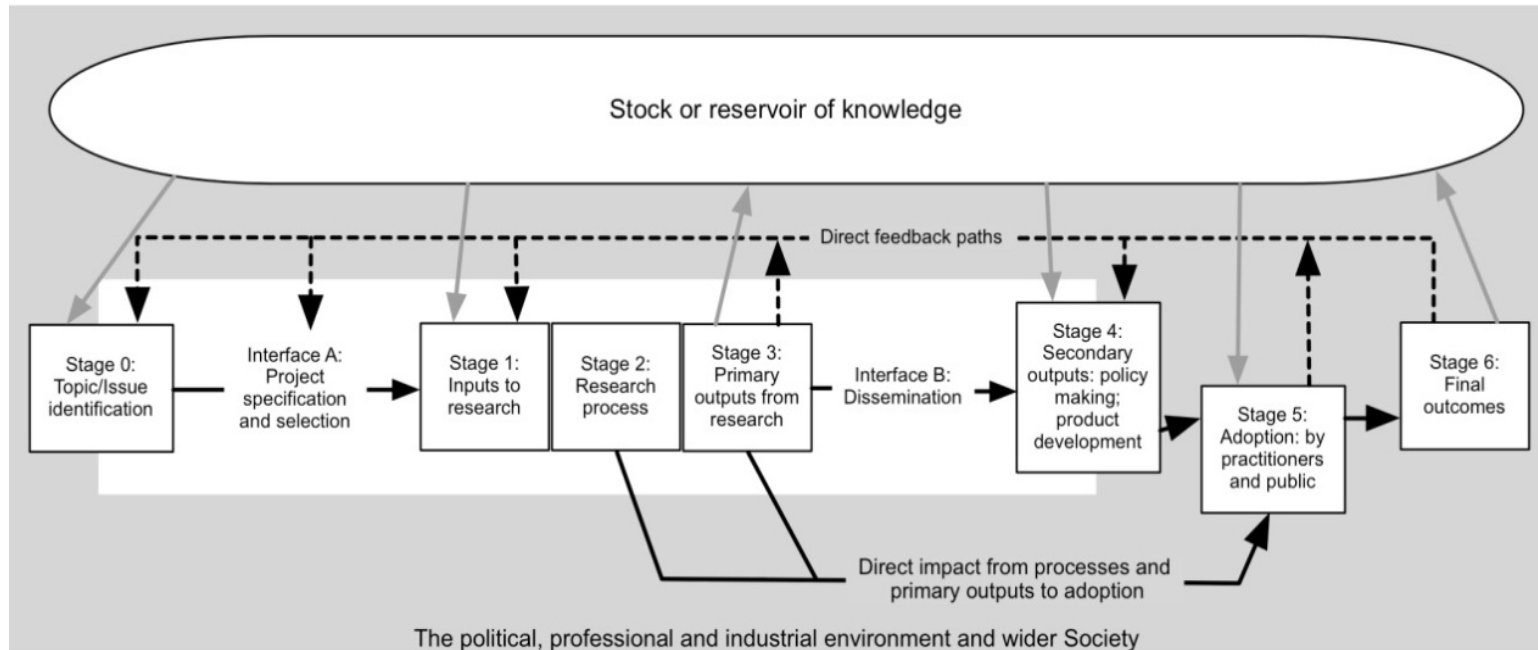
# Literature

- Nothing directly relevant found
- ‘Success & Survival of OR Groups’ from late 1990s
  - OR Society project, John Ranyard & others
- Evaluating the impact of (health) research
- Kirkpatrick levels for training
- Logic model





# Payback model of research impact



# Kirkpatrick levels

## Evaluation Levels

	Level	Measurement Focus
1	Reaction & Planned Action	Measures participant satisfaction with the program and captures planned actions.
2	Learning	Measures changes in knowledge, skills, and attitudes.
3	Application	Measures changes in on-the-job behavior.
4	Business Impact	Measures changes in business impact variables.
5	Return on Investment	Compares program benefits to the costs.



# Expert opinion

- HORF has been discussing what to make the subject of its workshop at its November meeting, and seems to be coming down on the side of: what makes a good OR group/how do you know if your OR group is any good. The S&S work has been mentioned in that context as well (largely because John Ranyard is secretary to the group). So - can you wait till November [2014]?
- About 15 years ago, the ECGD group got in John Ranyard and somebody else as external consultants to evaluate the group. They interviewed all the senior stakeholders and customers. Pretty soft measures, as we tended to be reducing risk/improving insight rather than actually making savings; but it did establish buy-in from key people, and threw up a few suggestions for improvement. [RUTH KAUFMAN]

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# Expert opinion

- I think the general message is to cast the net rather more widely than just money saving results - e.g. helping resolve a problem of major concern to an organisation, or opening up a new line of business, can also be fruitful avenues for O.R. [GEOFF ROYSTON]



# Expert opinion

- I remember when we had to justify our Branch, EOR4, to Joe Pilling, the then Dep Sec. Andre was very worried but we put on a rather good presentation. We talked in general about the value of OR in general with a bit of history. This was followed by choosing a few projects and our contributions. Importantly this was supplemented by our 'clients' comments on the worth of the work.  
[HOWARD MALIN]



# Logic model: Basic positions



- What we invest
  - can we distinguish our input from others?
- What we do
  - are our activities aligned with strategic priorities?
- Who we reach
  - are we reaching sufficiently senior people?
- Short term
  - can we show that something we expected has happened?
- Medium term
  - can we show it has some scope?

# Success & Survival

- be able to demonstrate clear value for money, namely project savings (much) greater than the cost of the group
- understanding the (changing) culture of the organisation
- be pragmatic when the occasion demands (perhaps obvious, but seemingly under-appreciated!)



# Alternatively: How not to make an impact

- Wrong project
  - wrong time
- Wrong level
  - specific v general
- Routine/low priority
- No buy-in
  - no visibility in the first place
- Wrong answers
  - this is rare!





# Conclusions

- Unlikely to be a simple (unitary, any) answer for impact evaluation of OR in Government
  - not even cost saving!
  - counterfactual
- More use in a structured approach taking in a variety of factors
  - Logic model
    - strategic fit
    - reducing uncertainty
    - resolving problems of major concern
    - supporting learning of key customers
- Or just a checklist to avoid pitfalls!

