

# Applying Mathematics to Public Services in Wales

Data & Knowledge Engineering Seminar

Dr. Geraint Palmer

November 18, 2019



**GIG**  
CYMRU  
**NHS**  
WALES

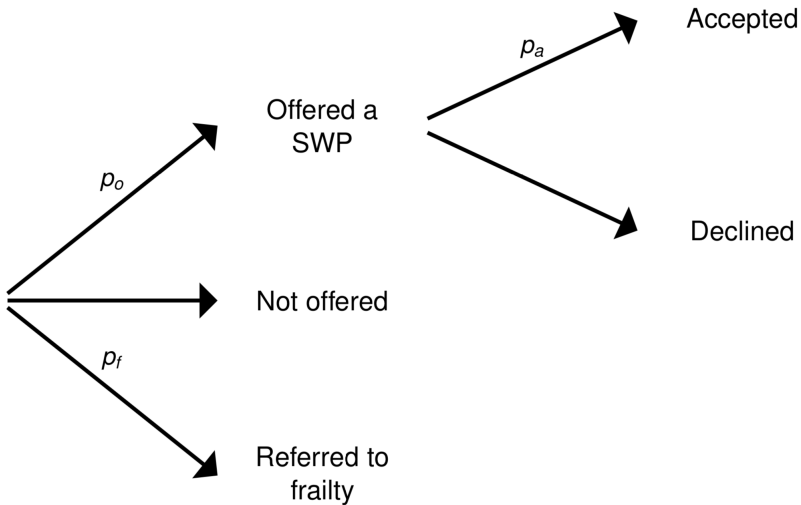
Bwrdd Iechyd Prifysgol  
Aneurin Bevan  
University Health Board

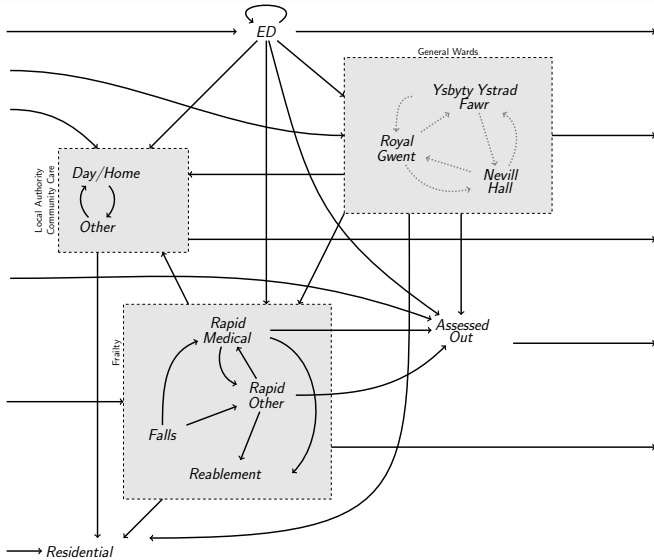


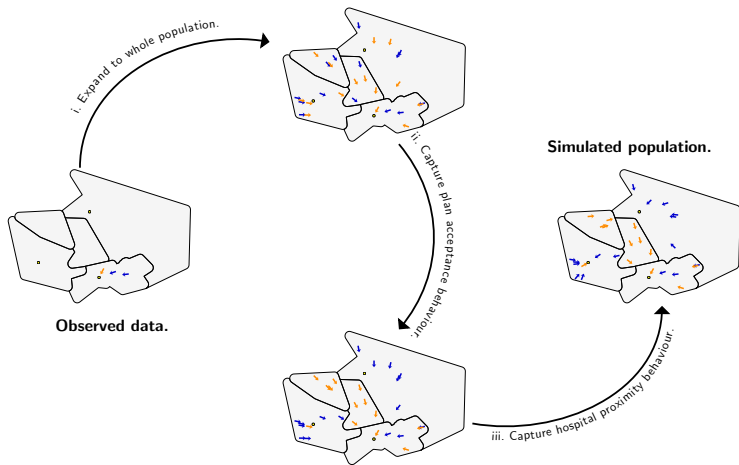
**Gwasanaeth Tân ac Achub  
Canolbarth a Gorllewin Cymru**

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**Mid and West Wales  
Fire and Rescue Service**





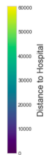
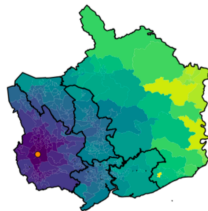
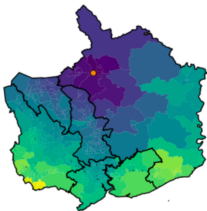
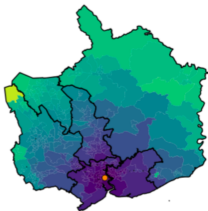


Royal Gwent

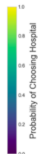
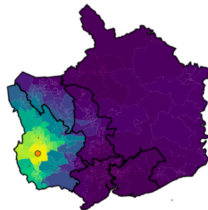
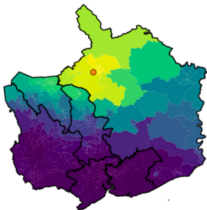
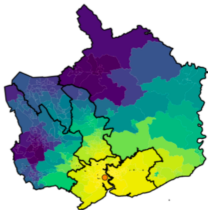
Nevill Hall

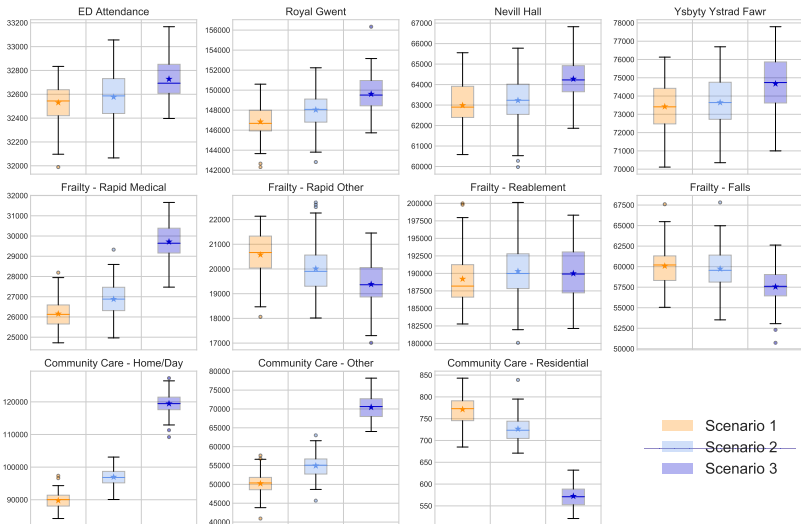
Ysbyty Ystrad Fawr

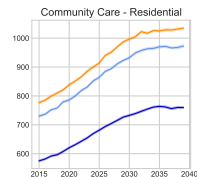
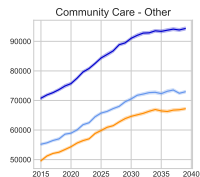
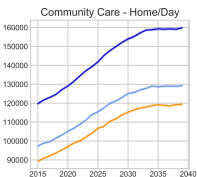
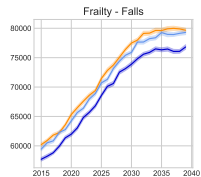
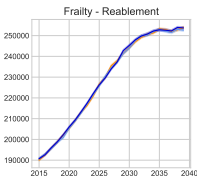
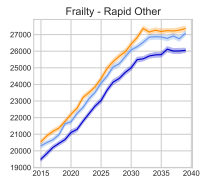
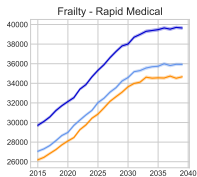
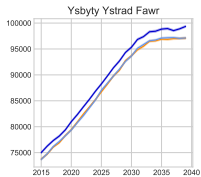
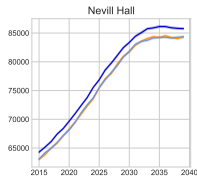
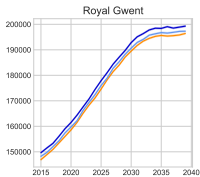
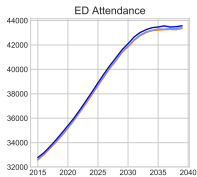
Distance



Probability



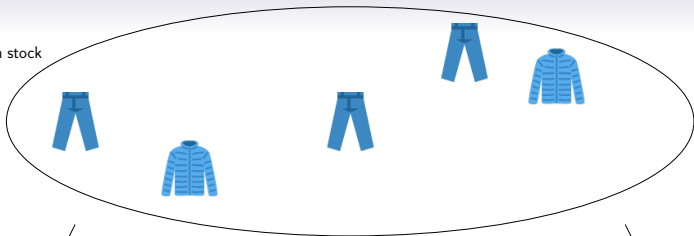




- Scenario 1
- Scenario 2
- Scenario 3



Loan stock



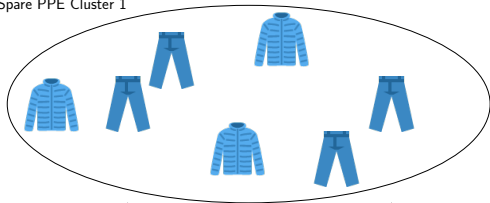
Spare PPE



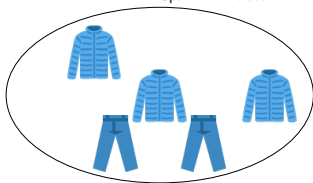
Primary PPE



Spare PPE Cluster 1

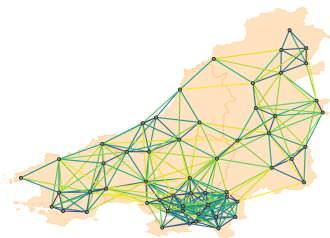
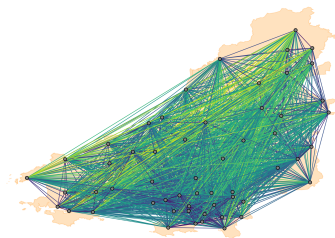


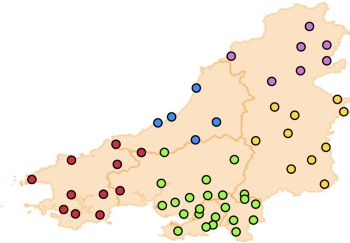
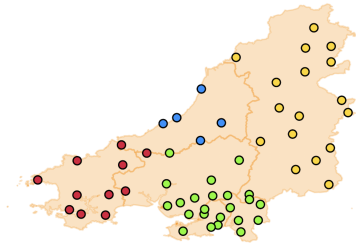
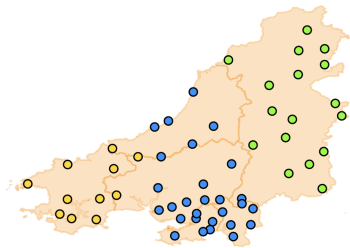
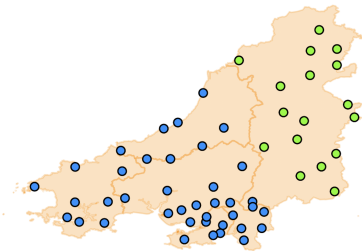
Spare PPE Cluster 2



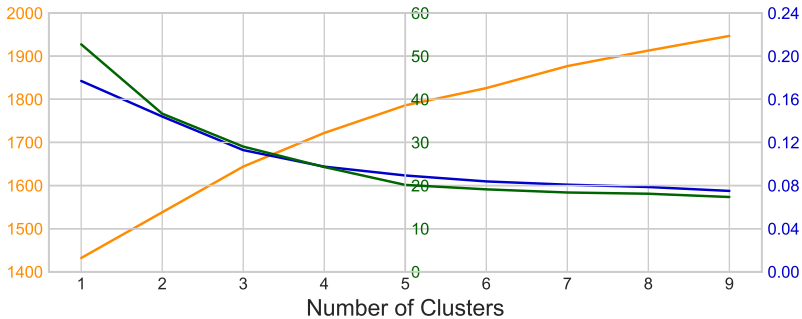
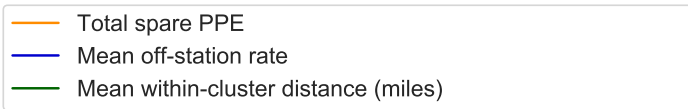
Primary PPE







$$\frac{1}{2} \sum_{l \in \mathcal{C}} \sum_{m \in \mathcal{M}} \sum_{t \in \mathcal{T}} \rho_{s,l} p_t n_t \lambda_{l,m,t}$$



# PPE Item Allocation

	Coat SML REG	Coat MED SHORT	Coat MED REG	...
Aberaeron	0	0	1	...
Abercrave	0	0	1	...
Aberystwyth	5	5	8	...
Amman Valley	0	0	0	...
Ammanford	0	4	1	...
Brecon	0	0	4	...
⋮	⋮	⋮	⋮	⋮

<https://ppe-configurations.github.io/>

- Thank you, questions?
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- @GeraintPalmer
- palmergi1@cardiff.ac.uk