

Modelling Covid 19

Estimation errors discussion paper 29 Jan 21

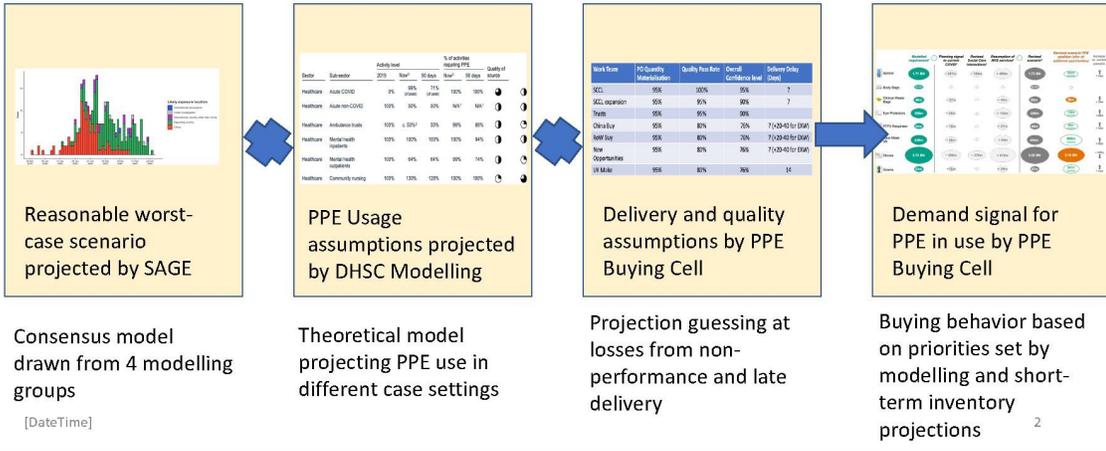
For discussion only – needs verification

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3

Estimation errors are magnified in modelling by cautious assumptions

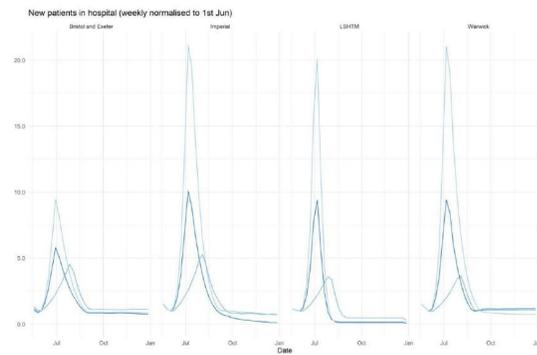
Example - PPE



Reasonable worst case scenario has itself many assumptions

Analysis of end-May RWCS [scenario](#)

- Projection of course of epidemic looking 8 months ahead
- Contains assumptions about cases needing ICU and critically, Length of Stay in hospital
- Consensus of four modelling groups and chooses one scenario regarding changes in R



Note: all 4 modelling groups predicted a second wave peaking in Jul-Sep 2020

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3

DHSC* Modelling group has to forecast PPE use from RWCS data

RWCS data has projections for

- Infections
- New patients admitted to hospital and ICU
- Beds occupied in hospital and ICUs
- Deaths

Sector	Sub-sector	Activity level			% of activities requiring PPE		Quality of source
		2019	Now ¹	90 days	Now ²	90 days	
Healthcare	Acute COVID	0%	99% (of peak)	71% (of peak)	100%	100%	● ●
Healthcare	Acute non-COVID	100%	50%	50%	N/A ¹	N/A ¹	● ●
Healthcare	Ambulance trusts	100%	c. 50% ²	50%	99%	88%	● ●
Healthcare	Mental health inpatients	100%	100%	100%	100%	94%	● ●
Healthcare	Mental health outpatients	100%	64%	64%	99%	74%	● ●
Healthcare	Community nursing	100%	139%	128%	100%	100%	● ●

DHSC has assumptions about PPE use in different care settings, which include estimating how many staff interactions occur in each setting. There is little historic data to inform these projections

Big uncertainty factor in May 2020 was about reopening hospitals for elective procedures

Product is PPE forecast by category

- Gowns
- Face Masks
- Respirators (high filtration masks)
- Gloves
- Eye protection
- Other

* 'McKinsey' modelling group

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PPE team applied uncertainty figures to the forecasts

- These were to allow for uncertainty of delivery from unproven counterparties, potential quality issues and delays in shipment
- Figures differed by channel – most certain existing NHS suppliers, least certain new Chinese sources through intermediaries

Work Team	PO Quantity Materialisation	Quality Pass Rate	Overall Confidence level	Delivery Delay (Days)
SCCL	95%	100%	95%	7
SCCL expansion	95%	95%	90%	7
Trusts	95%	95%	90%	
China Buy	95%	80%	76%	7 (+20-40 for EXW)
RoW Buy	95%	80%	76%	7 (+20-40 for EXW)
New Opportunities	95%	80%	76%	7 (+20-40 for EXW)
UK Make	95%	80%	76%	14

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Figures from 1 Jun 20

5

The actual Demand signal projected 90 days ahead – while we were buying 150 days ahead

Buying signal 13 May 20	Modelled requirement ¹	Planning signal to current COVID ²	Revised Social Care interactions ³	Resumption of NHS services ⁴	Revised scenario ⁵	Revised scenario PPE position (after all additional opportunities)	Increase vs. current scenario
Aprons	1.71 BN	- 287m	- 189m	+ 490m	1.73 BN	323m surplus	↑ +14m
Body Bags	90,000	-	-	-	90,000	-	-
Clinical Waste Bags	48m	- 27m	-	+ 45m	66m	28m	↑ +18m
Eye Protectors	356m	- 45m	-	+ 135m	446m	139m surplus	↑ +90m
FFP3 Respirator	33m	- 15m	-	+ 27m	45m	86m surplus	↑ +12m
Face Mask IIR	439m	- 38m	-	+ 94m	494m	988m surplus	↑ +56m
Gloves	3.72 BN	- 598m	- 379m	+ 810m	3.55 BN	2.19 BN	↓ -167m
Gowns	33m	-15m	-	+ 29m	47m	267m surplus	↑ +14m

Issues – ‘Whiplash’ effect propagates through to buying behaviour

- Uncertainties in estimates multiply up – to give a much bigger error bar for operational activity
- Duration of confidence of estimate may be much shorter than lead times of activity
- Limited ability to feed back ‘actual’ data and correct forecast dynamically