RCoA Royal College of Anaesthetists

WINTER SYMPOSIUM
3–4 December 2020

COVID-19 Chair: Dr Jamie Strachan

What Intensive Care Medicine has learned
Dr Alison Pittard OBE

PPE
Professor William Harrop-Griffiths

Risks to healthcare workers
Professor Tim Cook

Is it safe?

Prof Tim Cook
Bath

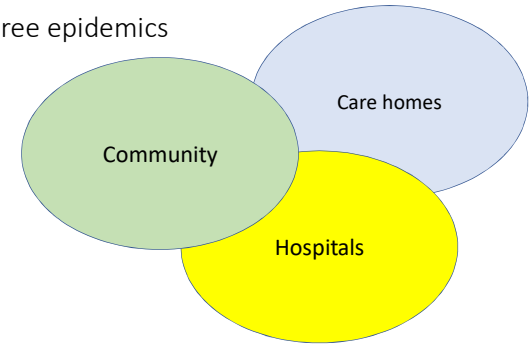
Twitter @doctimcook
Email timcook007@gmail.com

Is the population safe?

Are hospitals safe?

Are anaesthetist and intensivists safe?

Three epidemics

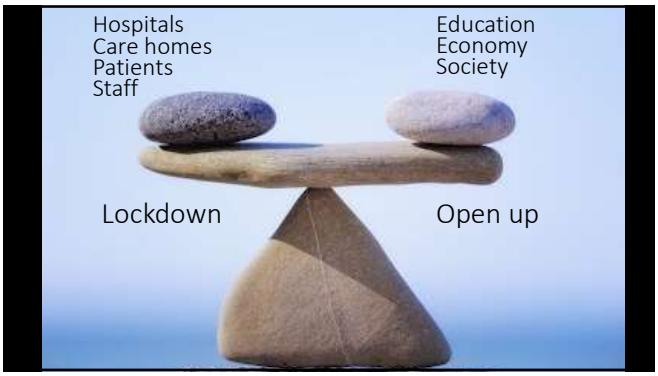


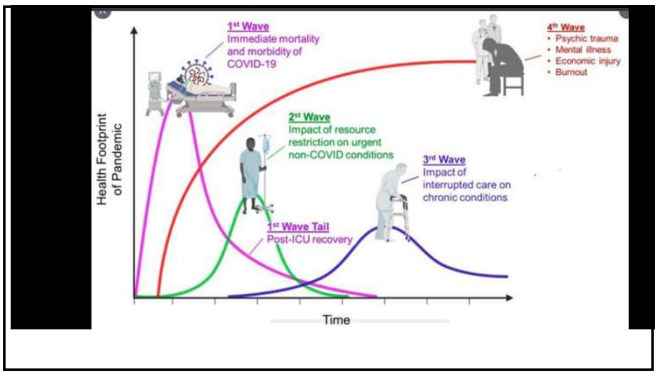
Is the population safe?

Context – 25 Sept

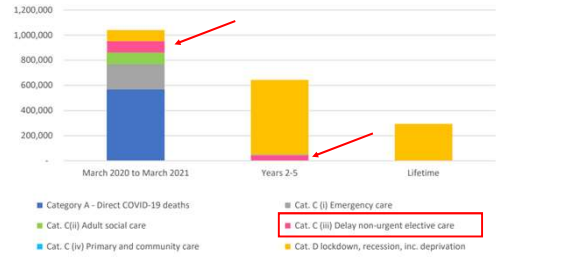
About 90% of population still at risk of COVID-19 (London 80%)
Desire to re-establish and maintain planned surgery (Simon Stephens)
Surgical priorities set by RCS
Reduced NHS hospital capacity (expanded ICUs, COVID-19 care, socially distanced beds)
Stress on system likely to rise over winter
Current evidence of rising rates of COVID-19 throughout UK (ONS)

COVIDsurg
NICE 179 July 2020
PHE changes Sept 2020





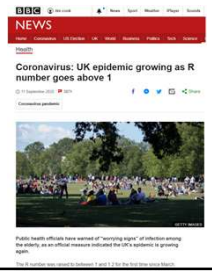
Direct and indirect impacts of COVID-19 on excess deaths and morbidity (SAGE)

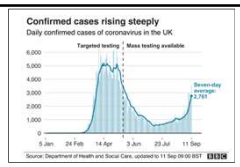


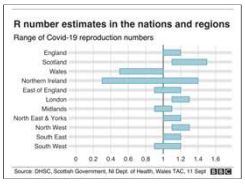
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907616/s0650-direct-indirect-impacts-covid-19-excess-deaths-morbidity-sage-48.pdf

11 September

R = 1.0-1.2

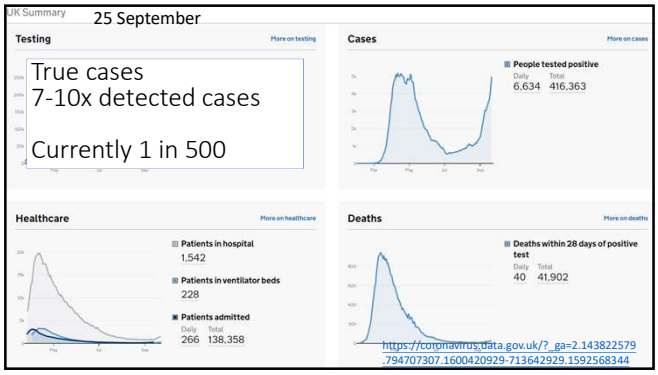






https://www.bbc.co.uk/news/health-54116939

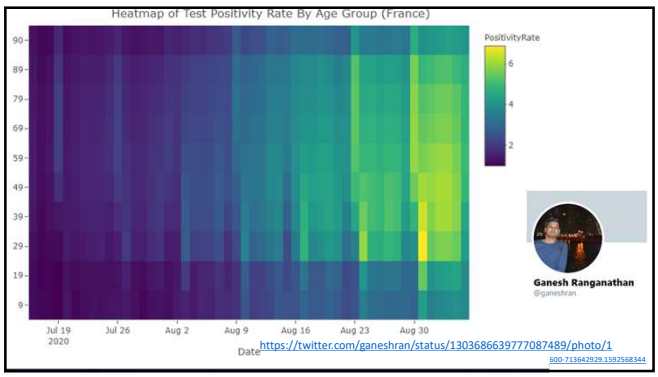
25 September



True cases
7-10x detected cases

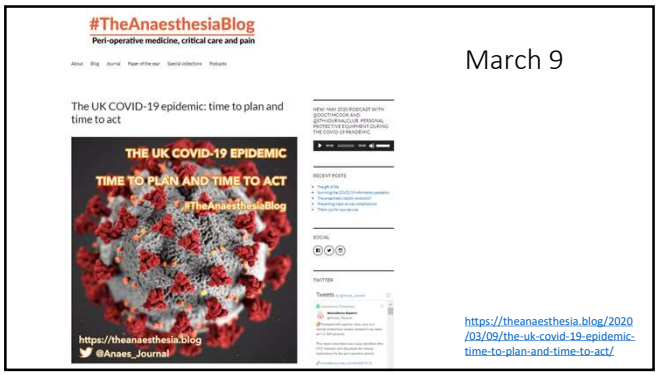
Currently 1 in 500

https://coronavirus.data.gov.uk/?_ga=2.143822579.794707307.1600420929-713642929.1592568344



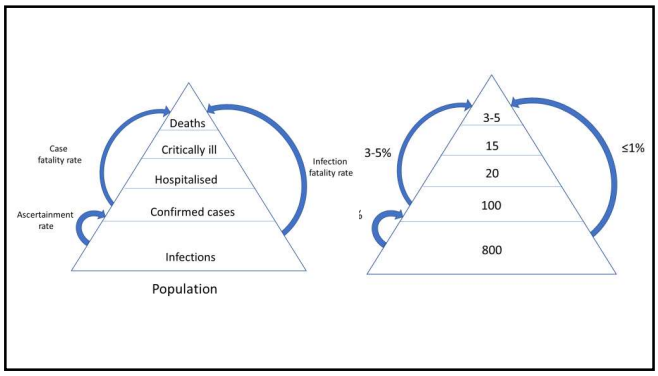
https://twitter.com/ganeshran/status/1303686639777087489/photo/1

600-713642929.1592568344

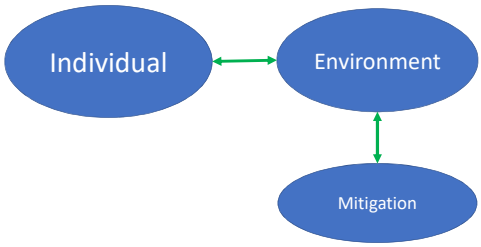


March 9

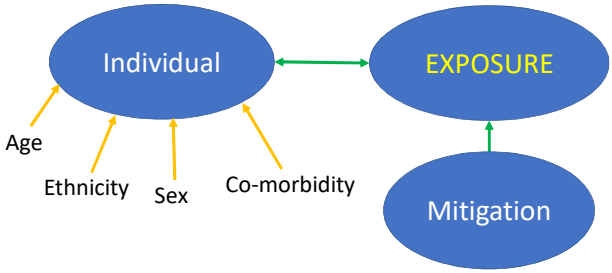
https://theanaesthesia.blog/2020/03/09/the-uk-covid-19-epidemic-time-to-plan-and-time-to-act/



Risk



Risk of (harm from) COVID



Patients at risk of harm from COVID

3 major risk factors
Age: mortality from COVID rises 12% each year of age
Age: mortality risk doubles (200%) every 5-6 years
Age: mortality risk rises 10-fold (1000%) each generation (20 yrs)


What have been the fatal risks of Covid, particularly to children and younger adults?

Summary

https://medium.com/wintoncentre/what-have-been-the-fatal-risks-of-covid-particularly-to-children-and-younger-adults-a5cbf7060c49

Patients at risk of harm from COVID

3 major risk factors

Age: mortality from COVID rises 12% each year of age
Age: mortality risk doubles (200%) every 5-6 years
Age: mortality risk rises 10-fold (1000%) each generation (20 yrs)

Age 65-74 vs 15-44
- half as likely to get COVID-19
- 100x more likely to die from it

REACT-2
https://www.medrxiv.org/content/10.1101/2020.08.12.20173690v2.full.pdf

Patients at risk of harm from COVID

3 major risk factors

Age
Age
Age

3 lesser risk factors

Sex – male risk up 70%
Ethnicity – non-white risk up 50-100%
Comorbidity – risk up 10-200%

ANALYSIS

Check for updates

[1] Winton Centre for Risk and Evidence Communication, Statistical Laboratory Centre for Mathematical Sciences, Cambridge, UK
david@statslab.cam.ac.uk
Cite this as: *BMJ* 2020;370:m3259
http://dx.doi.org/10.1136/bmj.m3259
Published: 09 September 2020

Use of "normal" risk to improve understanding of dangers of covid-19

Accumulating data on deaths from covid-19 show an association with age that closely matches the "normal" risk we all face. Explaining risk in this way could help people understand and manage their response, says David Spiegelhalter

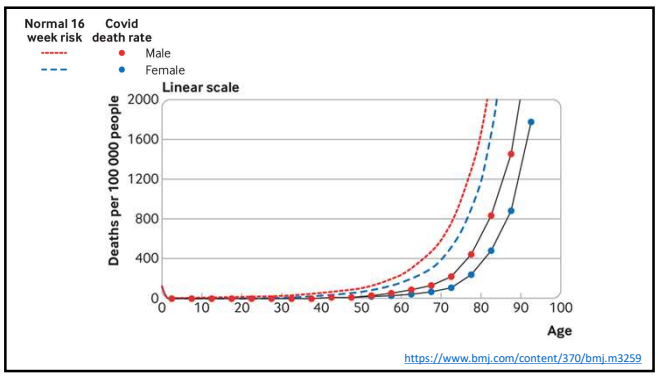
David Spiegelhalter *chair*[1]

As covid-19 turns from a societal threat into a matter of risk management, it is vital that the associated risks are understood and clearly communicated.[1] But these risks vary hugely between people, and so finding appropriate analogues is a challenge. Although covid-19 is a complex multisystem disease that can cause prolonged illness, here I focus solely on the risks of dying from covid-19 and explore the use of "normal" risk—the risk of death from all causes each year—as an aid to transparent communication.

from and with the virus, while underestimating the true number of deaths linked to covid-19 because of underdiagnosis in people who did not display classic symptoms, were not tested, and so did not have covid-19 mentioned on the death certificate.

In the 16 weeks (112 days) between 7 March and 26 June 2020, 218 354 deaths were registered in England and Wales, compared with an average of 159 595 for this period over the past five years. This is an absolute excess of 58 759 deaths, corresponding to a relative

https://www.bmj.com/content/370/bmj.m3259



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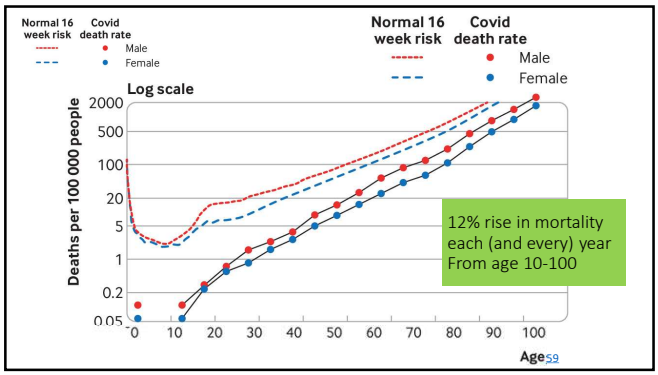
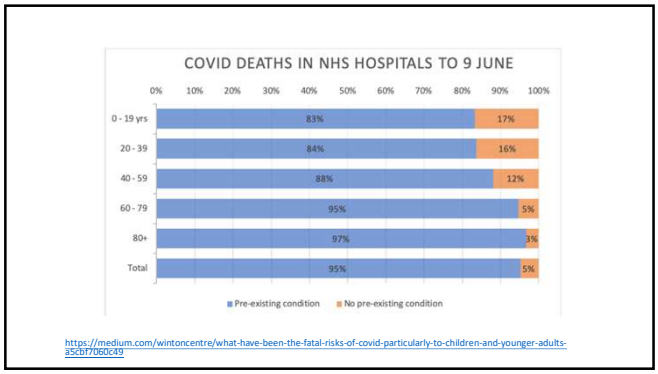
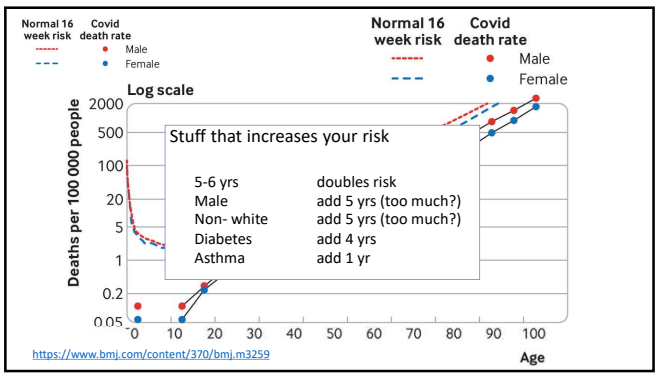
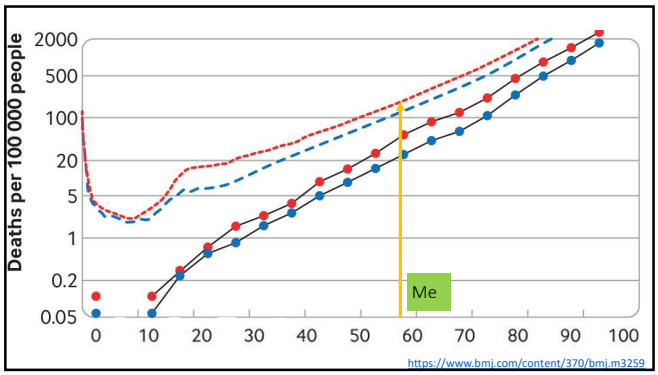


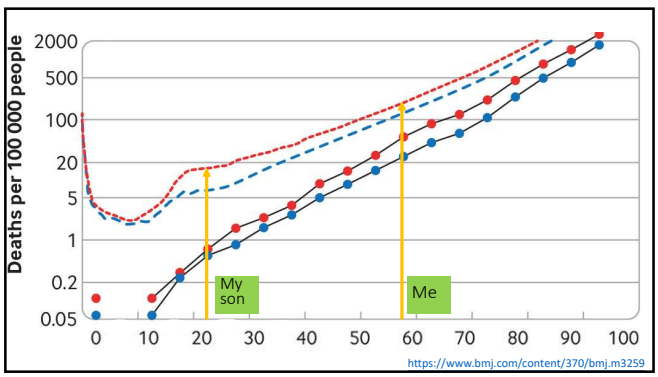
59



https://medium.com/wintoncentre/what-have-been-the-fatal-risks-of-covid-particularly-to-children-and-younger-adults-a5cbf7060c49


Normal 16 week risk
Covid death rate
Male
Female
Log scale
Deaths per 100 000 people
2000
500
100
20
5
1
0.2
0.05
0 10 20 30 40 50 60 70 80 90 100
Age
Stuff that increases your risk
5-6 yrs doubles risk
Male add 5 yrs (too much?)
Non- white add 5 yrs (too much?)
Diabetes add 4 yrs
Asthma add 1 yr
https://www.bmj.com/content/370/bmj.m3259


Deaths per 100 000 people
2000
500
100
20
5
1
0.2
0.05
0 10 20 30 40 50 60 70 80 90 100
Me
https://www.bmj.com/content/370/bmj.m3259


Deaths per 100 000 people
2000
500
100
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5
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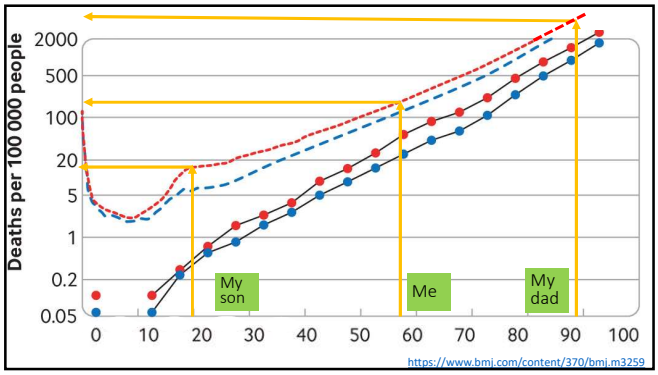
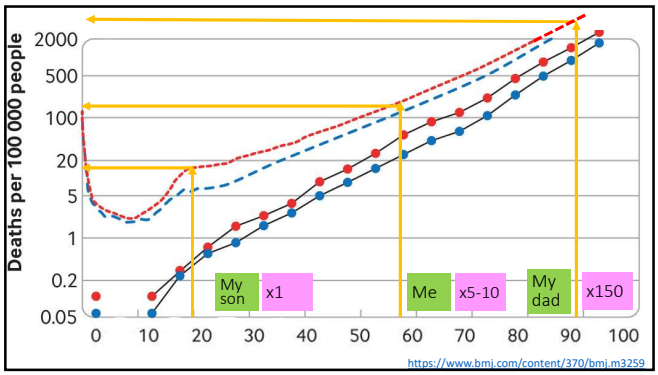
0.2
0.05
0 10 20 30 40 50 60 70 80 90 100
My son
Me
https://www.bmj.com/content/370/bmj.m3259





Risk factors

Anaesthesia 2020 doi:10.1111/anae.15220

Review Article

Risk to health from COVID-19 for anaesthetists and intensivists – a narrative review

T. M. Cook

Consultant, Royal United Hospital, Bath, UK and Honorary Professor of Anaesthesia, University of Bristol, UK

Summary

Healthcare workers are at an increased risk of infection, harm and death from COVID-19. Close and prolonged exposure to individuals infectious with SARS-CoV-2 leads to infection. A person's individual characteristics (age, sex, ethnicity and comorbidities) then influence the subsequent risk of COVID-19 leading to hospitalisation, critical care admission or death. While relative risk is often reported as a measure of individual danger, absolute risk is more important and dynamic, particularly in the healthcare setting. Individual risk interacts with exposure and environmental risk-factors, and the extent of mitigation to determine overall risk. Hospitals are a unique environment in which there is a significantly increased risk of infection for all healthcare workers. Anaesthetists and intensivists particularly are at high risk of exposure to SARS-CoV-2 infected patients due to their working

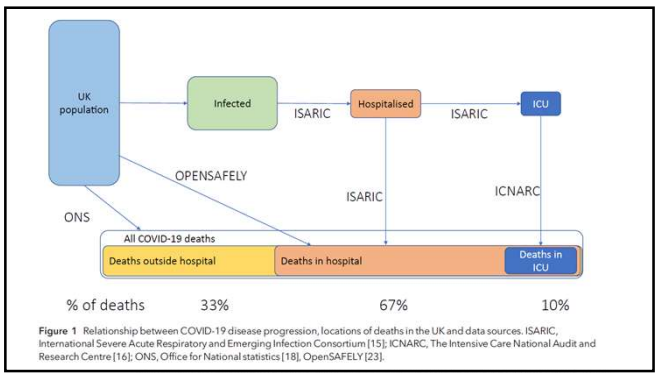


Figure 1 Relationship between COVID-19 disease progression, locations of deaths in the UK and data sources. ISARIC, International Severe Acute Respiratory and Emerging Infection Consortium [15]; ICNARC, The Intensive Care National Audit and Research Centre [16]; ONS, Office for National statistics [18], OpenSAFELY [23].

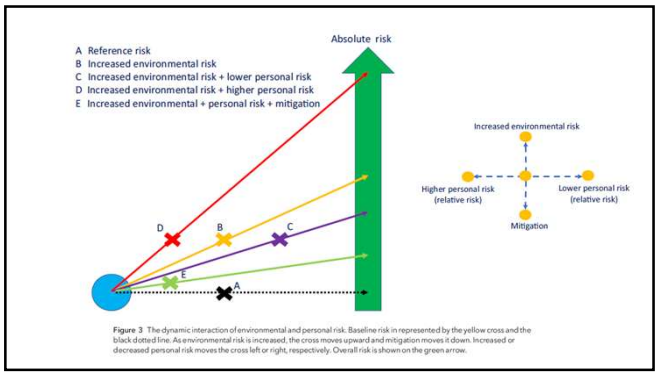
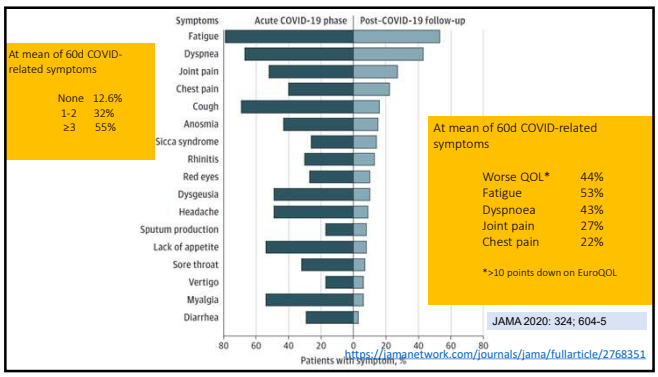
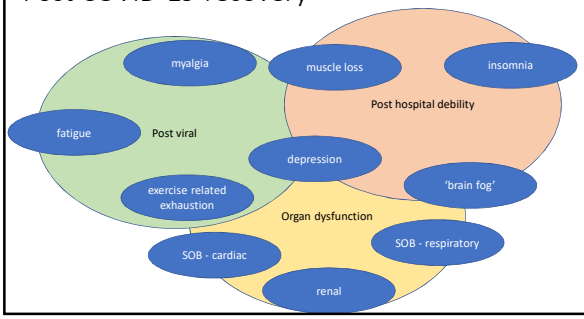


Figure 3 The dynamic interaction of environmental and personal risk. Baseline risk in represented by the yellow cross and the black dotted line. As environmental risk is increased, the cross moves upward and mitigation moves it down. Increased or decreased personal risk moves the cross left or right, respectively. Overall risk is shown on the green arrow.

Long COVID



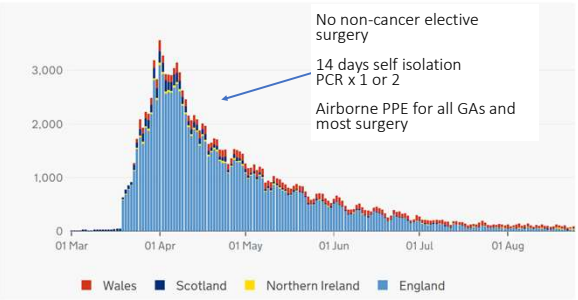
Post COVID-19 recovery



Is the population safe?

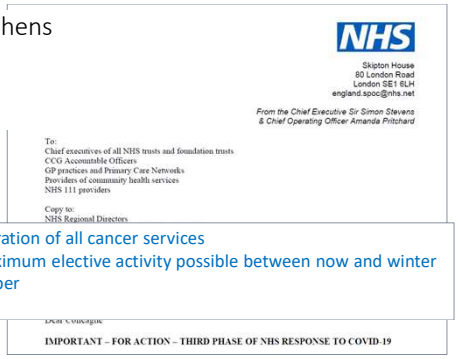
Are hospitals safe?

UK COVID hospital admissions



Sir Simon Stephens 3rd phase plan

31 July



NHS

Skipton House
80 London Road
London SE1 6LH
england.spoc@nhs.net

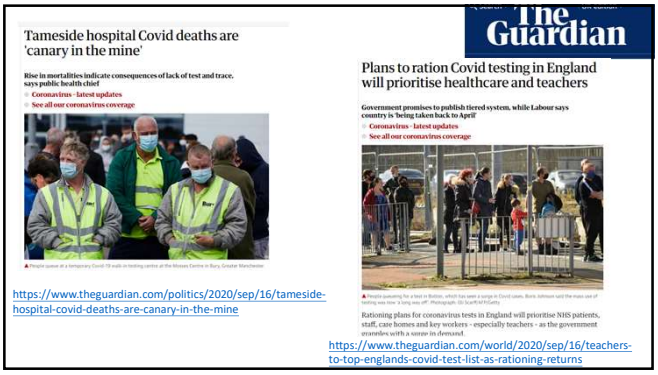
From the Chief Executive Sir Simon Stevens & Chief Operating Officer Amanda Pritchard

To:
Chief executives of all NHS trusts and foundation trusts
CCG Accountable Officers
GP practices and Primary Care Networks
Providers of community health services
NHS 111 providers

Copy to:
NHS Regional Directors

IMPORTANT – FOR ACTION – THIRD PHASE OF NHS RESPONSE TO COVID-19

Restore full operation of all cancer services
Recover the maximum elective activity possible between now and winter
- 80% September
- 90% October



Tameside hospital Covid deaths are 'canary in the mine'

Rise in mortalities indicate consequences of lack of test and trace, says public health chief

Coronavirus - latest updates
See all our coronavirus coverage

https://www.theguardian.com/politics/2020/sep/16/tameside-hospital-covid-deaths-are-canary-in-the-mine

The Guardian

Plans to ration Covid testing in England will prioritise healthcare and teachers

Government promises to publish tiered system, while Labour says country is 'being taken back to April'

Coronavirus - latest updates
See all our coronavirus coverage

Rationing plans for coronavirus tests in England will prioritise NHS patients, staff, care homes and key workers - especially teachers - as the government scrambles with a surge in demand

https://www.theguardian.com/world/2020/sep/16/teachers-to-top-englands-covid-test-list-as-rationing-returns

Why is coming into hospital dangerous?

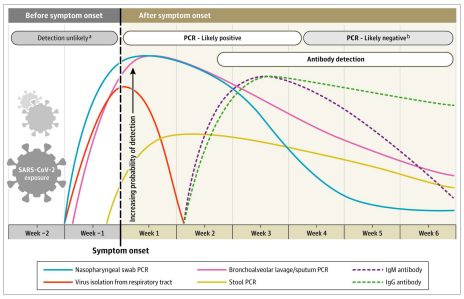
1 Attending while brewing COVID

2 Getting COVID in hospital

- from other patients
- from staff

3 Post operative immunosupresssion and debilitation increasing risk from subsequent COVID-19

Sethuraman et al JAMA April 2020



https://jamanetwork.com/journals/jama/fullarticle/2765837

medRxiv

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Comments (2)

SARS-CoV-2, SARS-CoV-1 and MERS-CoV viral load dynamics, duration of viral shedding and infectiousness: a living systematic review and meta-analysis

Muge Cevik, Matthew Tate, Oliver Lloyd, Alberto Enrico Maraolo, Jenna Schafers, Antonia Ho

doi: https://doi.org/10.1101/2020.07.25.20162107

https://www.medrxiv.org/content/10.1101/2020.07.25.20162107v2

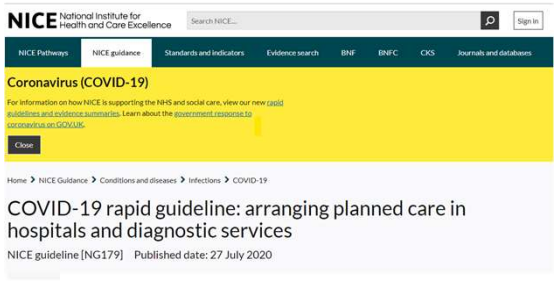
COVID-19 viral dynamics

Incubation	around 5d (up to 14)
Viral secretion (infectious)	up to 9d
Maximum infectivity	probably day 0-5 of symptoms
Maximum transmission	day 0-5
Asymptomatic infection	certainly

	Mean duration	Maximum	Maximum
Upper Respiratory tract	17	83	9
Lower Respiratory tract	14.6	59	9
Stool	17.2	35	
Serum	16.6	60	

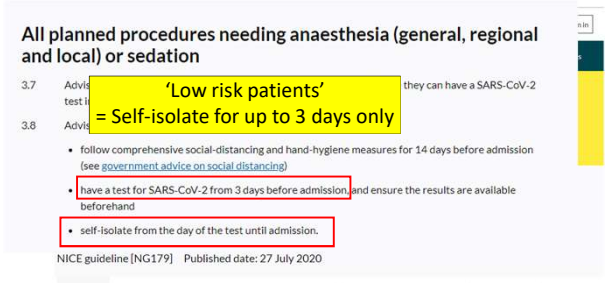
https://www.medrxiv.org/content/10.1101/2020.07.25.20162107v2

NICE 27 July

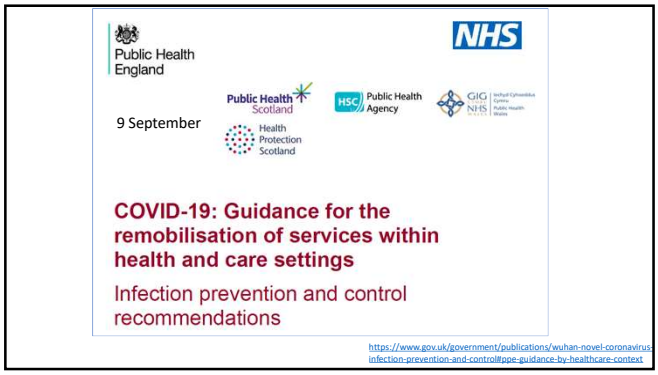


https://www.nice.org.uk/guidance/ng179

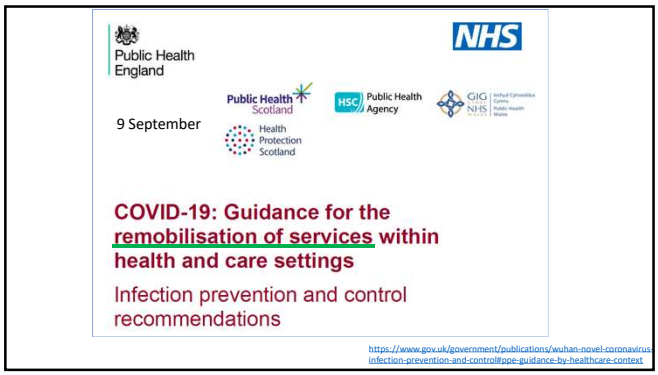
NICE



- https://www.nice.org.uk/guidance/ng179



https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context



https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

Patients/Individuals treatment, care and support to be managed in 3 COVID-19 pathways:

- **High risk:** There is no change in recommendations for IPC or for the use of PPE by staff when managing patients/individuals who have, or are likely to have, COVID-19
- **Medium risk:** This includes patients/individuals who have no symptoms of COVID-19 but do not have a COVID-19 SARS- CoV-2 PCR test result.
- **Low risk:** Patients/individuals with no symptoms and a negative COVID-19 SARS-CoV-2 PCR test who have self-isolated prior to admission for example following NICE guidance

https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

5. Standard Infection Prevention Control Precautions (SICPs): all pathways or settings

SICPs are the basic IPC measures necessary to reduce the risk of transmitting infectious agents from both recognised and unrecognised sources of infection and are required across ALL COVID-19 pathways.

remobilisation of services within health and care settings

Infection prevention and control recommendations

https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

7.3.1 Operating theatres and procedure rooms

Within the low risk COVID-19 pathway, standard theatre cleaning and time for air changes provides appropriate levels of IPC and there is no requirement for additional cleaning or theatre down time unless the patient has another infectious agent that requires additional IPC measures.

7.4 Aerosol Generating Procedures (AGPs): procedures that create a higher risk of respiratory infection transmission

Airborne precautions are NOT required for AGPs on patients/individuals in the low risk COVID-19 pathway, providing the patient has no other infectious agent transmitted via the droplet or airborne route.

There is no additional requirement for ventilation or downtime in this pathway, providing safe systems of work, including engineering controls are in place.

https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

5. Standard Infection Prevention Control Precautions (SICPs): all pathways or settings

SICPs are the basic IPC measures necessary to reduce the risk of transmitting infectious agents from both recognised and unrecognised sources of infection and are required across ALL COVID-19 pathways.

8. Transmission Based Precautions (TBPs)

Transmission Based Precautions (TBPs) are **additiona**l measures (to SICPs) required when caring for patients/ individuals with a known or suspected infection such as COVID-19.

https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

Public Health England

NHS

COVID-19: Guidance for the remobilisation of services within health and care settings

Infection prevention and control recommendations

High and medium risk paths: transmission based precautions

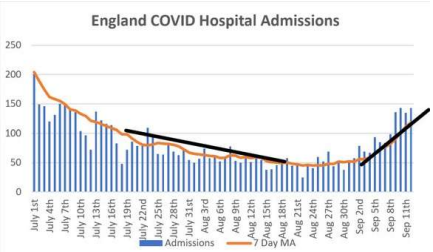
- Airborne PPE for AGPs
- Fallow time after anaesthetic interventions
- Supplemented cleaning

Low risk pathways: standard infection control procedures

- none of the above

https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

11 September

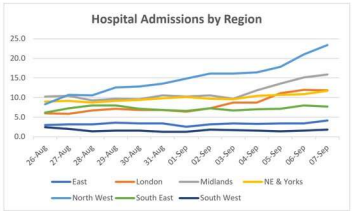


18 Sept
BBC Radio 4
Matt Hancock

"Hospital admissions are doubling every 8 days"

https://twitter.com/john_actuary/status/1305763456994488320?s=20

9 Sept England

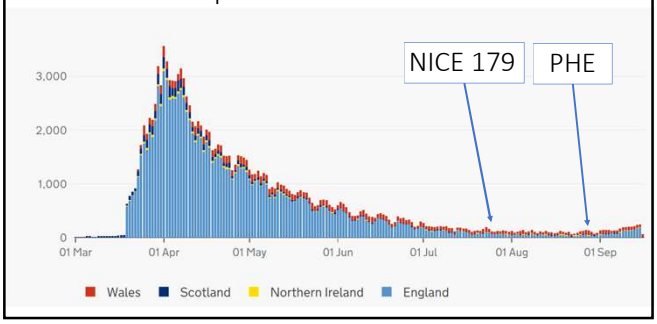


John R
@john_actuary

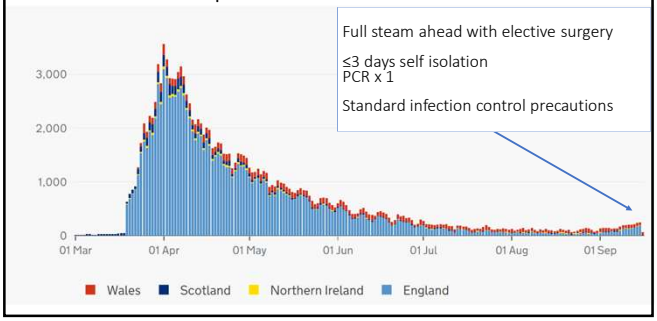
	7 Day Moving Average of Regional Hospital Admissions							
	East	London	Midlands	NE & Yorks	North West	South East	South West	Total
26-Aug	3.0	6.0	10.3	9.0	8.3	6.1	2.4	**45.1**
07-Sep	4.1	11.9	15.9	11.7	23.4	7.7	1.9	**76.6**
Increase	38%	98%	54%	30%	183%	26%	-24%	**70%**

https://twitter.com/john_actuary/status/1292416783417315329

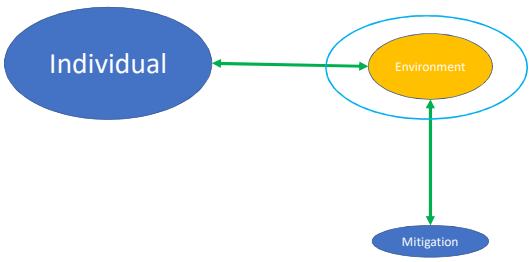
UK COVID hospital admissions



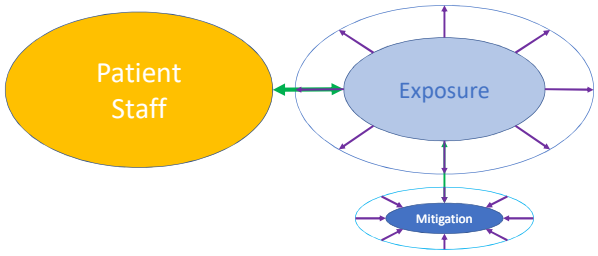
UK COVID hospital admissions



Mitigation before end August ……. July



Mitigation…. after NICE/PHE….
And risk …… going into winter



COVIDsurg

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31182-X/fulltext

Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study

COVIDSurg Collaborative*

Summary

Background The impact of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on postoperative recovery needs to be understood to inform clinical decision making during and after the COVID-19 pandemic. This study reports 30-day mortality and pulmonary complication rates in patients with perioperative SARS-CoV-2 infection.

Methods This international, multicentre, cohort study at 235 hospitals in 24 countries included all patients undergoing surgery who had SARS-CoV-2 infection confirmed within 7 days before or 30 days after surgery. The primary outcome measure was 30-day postoperative mortality and was assessed in all enrolled patients. The main secondary outcome measure was pulmonary complications, defined as pneumonia, acute respiratory distress syndrome, or unexpected postoperative ventilation.

Findings This analysis includes 1128 patients who had surgery between Jan 1 and March 31, 2020, of whom 835 (74·0%) had emergency surgery and 280 (24·8%) had elective surgery. SARS-CoV-2 infection was confirmed preoperatively in

Published Online May 29, 2020 https://doi.org/10.1016/S0140-6736(20)31182-X

See Online/Comment https://doi.org/10.1016/S0140-6736(20)31256-3

*Collaborating authors are listed in the appendix (pp 1-7)

Correspondence to: Mr Aneel Bhangu, National Institute for Health Research Global Health Research Unit on Global Surgery, Heritage

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31182-X/fulltext

Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study

COVIDSurg Collaborative*

24% 30-d mortality
51% severe pulmonary complications

Mortality risks	odds ratio
ASA ≥3–5	2·35 [1·57–3·53], p<0·0001
age ≥70 years	2·30 [1·65–3·22], p<0·0001
male sex	1·75 [1·28–2·40], p<0·0001
Emergency	1·67 [1·06–2·63], p=0·026
Cancer surgery	1·55 [1·01–2·39], p=0·046
Major vs minor	1·52 [1·01–2·31], p=0·047

Mortality UNaffected by

Timing of COVID diagnosis

Type of anaesthesia

✓ LA	31%	
✓ RA	22%	
✓ GA	25%	P=0.488

Patients for elective surgery
3 groups

1. Low risk young patients	Carry on
2. Higher risk and older patients	Shared decision making & inform of increased risk from hospital
3. Patients who have had COVID-19	Defer or MDT (incl anaesthesia); complex and unknown

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevier.com/locate/jhin

Nosocomial COVID-19 infection: examining the risk of mortality. The COPE-Nosocomial Study (COVID in Older PEople)

B. Carter[a,1], J.T. Collins[b,1], F. Barlow-Pay[c], F. Rickard[d], E. Bruce[e], A. Verduri[f], T.J. Quinn[g], E. Mitchell[h], A. Price[i], A. Vilches-Moraga[j], M.J. Stechman[k], R. Short[m], A. Einarsson[n], P. Braude[h], S. Moug[o], P.K. Myint[p], J. Hewitt[q,r,*], L. Pearce[s,2], K. McCarthy[t,2], on behalf of the COPE Study Collaborators[l]

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7372282/pdf/main.pdf

COPE-nosocomial

10 UK and 1 Italian hospitals

1564 COVID-19 patients

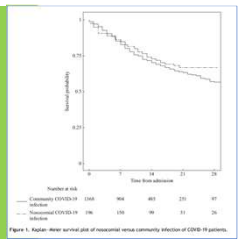
- 196 >15d after admission	12.5%	(hospital acquired)
- 169 2-14d after admission	10.8%	(uncertain)*
- 1199 0-1d after admission	76.7%	(community acquired)

*Uncertain were included in community-acquired

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7372282/pdf/main.pdf

COPE-nosocomial

Time to infection	
Community acquired	median 1d (IQR 0-1d)
Hospital acquired	median 32.5d (IQR 23-54)
LOS	
Community acquired	median 16d
Hospital acquired	median 33d
Mortality	
Community acquired	27.2%
Hospital acquired	27%



https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7372282/pdf/main.pdf

25 October

"they also had better outcomes than those admitted with the virus, probably because of faster diagnosis and, therefore, treatment."

"those caveats do suggest the risk of catching the virus in hospital remains still small."

ONS – PCR surveillance

Staying at home	1
Working outside home	2.49 (1.4-4.5)
Non-patient facing work	1
Patient facing work	4.06 (2.4-6.8)
Contact with hospital – personally	2.20 (1.1-4.2)
Contact with hospital – household member	1.99 (0.9-4.1)

61% of +ves asymptomatic

https://www.medrxiv.org/content/10.1101/2020.07.06.20147348v1

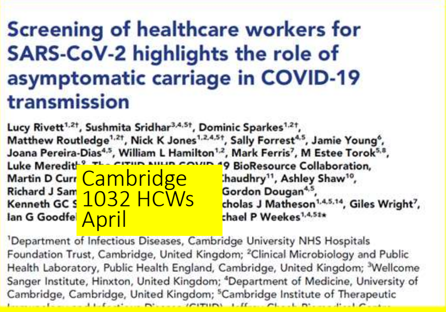
Is the population safe?

Are hospitals safe?

Are anaesthetist and intensivists safe?

Cambridge

eLife


Screening of healthcare workers for SARS-CoV-2 highlights the role of asymptomatic carriage in COVID-19 transmission

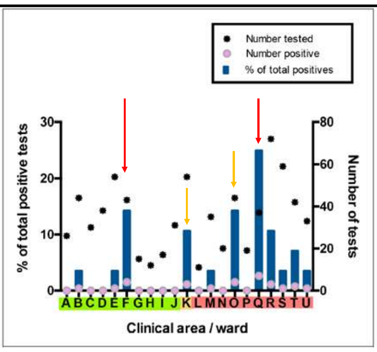
Lucy Rivett[1,2†], Sushmita Sridhar[3,4,5†], Dominic Sparkes[1,2†], Matthew Routledge[1,2†], Nick K Jones[1,2,4,5†], Sally Forrest[4,5], Jamie Young[6], Joana Pereira-Dias[4,5], William L Hamilton[1,2], Mark Ferris[7], M Estee Torok[5,8], Luke Meredit… 9 BioResource Collaboration, Martin D Curr… haudhry[11], Ashley Shaw[10], Richard J Sam… Gordon Dougan[4,5], Kenneth GC S… cholas J Matheson[1,4,5,14], Giles Wright[7], Ian G Goodfe… chael P Weekes[1,4,5‡*]

[1]Department of Infectious Diseases, Cambridge University NHS Hospitals Foundation Trust, Cambridge, United Kingdom; [2]Clinical Microbiology and Public Health Laboratory, Public Health England, Cambridge, United Kingdom; [3]Wellcome Sanger Institute, Hinxton, United Kingdom; [4]Department of Medicine, University of Cambridge, Cambridge, United Kingdom; [5]Cambridge Institute of Therapeutic

Cambridge
1032 HCWs
April

https://elifesciences.org/articles/58728

Identification of clusters of cases



https://elifesciences.org/articles/58728

Identification of clusters of cases

Detection
- By screening mostly!
- Most asymptomatic

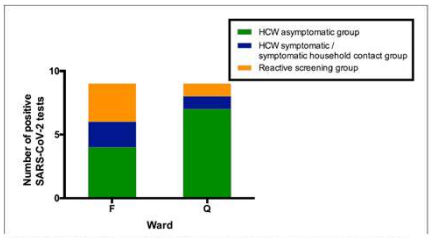


Figure 4. All SARS-CoV-2 positive HCW identified in Wards F and Q, stratified by their mechanism of identification. Individuals testing positive for SARS-CoV-2 in the 'HCW asymptomatic screening group' were identified by the asymptomatic screening programme. Individuals testing positive in the 'HCW symptomatic/symptomatic household contact groups' were identified by self-presentation after developing symptoms. Individuals testing positive in the 'Reactive screening group' were identified by an intensified screening programme after initial positive clusters had been recognised. The online version of this article includes the following figure supplement(s) for figure 4:

https://elifesciences.org/articles/58728

REACT-2 Imperial: 11.7% vs 6%

Antibody prevalence for SARS-CoV-2 following the peak of the pandemic in England: REACT2 study in 100,000 adults

National REal-time Assessment of Community Transmission-2 (REACT-2) prevalence study using a self-administered lateral flow immunoassay (LFIA) test for IgG among a random population sample of 100,000 adults over 18 years in England, 20 June to 13 July 2020.

Care home workers	HR 3.1
Patient-facing	HR 2

https://www.medrxiv.org/content/10.1101/2020.08.12.20173690v2.full.pdf

Oxford staff serology: 11% vs 6.8%

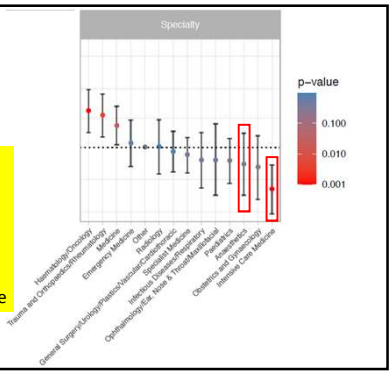
https://www.medrxiv.org/content/10.1101/2020.06.24.20135038v2

Oxford

https://www.medrxiv.org/content/10.1101/2020.06.24.20135038v2.full.pdf

Anaesthesia
Low rates of infection
Despite airway care

ICU
Low rates of infection
Despite high COVID pressure



SAFER study: London 45% vs 15%

SARS-CoV-2 virus and antibodies in front-line Health Care Workers in an acute hospital in London: preliminary results from a longitudinal study

Running title

SARS-CoV-2 incidence in Health Care Workers

1. Catherine F Houlihan, PhD, Dept Clinical Virology at UCLH, Department infection and Immunity at UCL, Department of Clinical Research at LSHTM, London, UK

https://www.medrxiv.org/content/10.1101/2020.06.08.20120584v1

SAFER study

	Total	SARS-CoV-2 PCR negative throughout the study period	At least 1 sample PCR positive for SARS-CoV-2 during study period	P-value	Serology negative at both time points	Serology positive at both time points	Sero-converted from serology negative to serology positive	Only one serology sample submitted	Positive serology or positive SARS-CoV-2 PCR during study period	P-value
Other	22 (100%)	16 (73%)	6 (27%)		10 (45%)	5 (23%)	4 (18%)	3 (14%)	9 (41%)	
Main ward				0.19						0.69
A&E	34 (100%)	24 (71%)	10 (29%)		18 (53%)	6 (18%)	6 (18%)	4 (12%)	13 (38%)	
Acute Medical Admissions	37 (100%)	30 (81%)	7 (19%)		15 (41%)	10 (27%)	7 (19%)	5 (14%)	19 (51%)	
ITU	43 (100%)	39 (91%)	4 (9%)		22 (51%)	11 (26%)	4 (9%)	6 (14%)	16 (37%)	
Haematology	40 (100%)	32 (80%)	8 (20%)		21 (53%)	9 (23%)	9 (23%)	1 (3%)	19 (48%)	
Ward other	43 (100%)	32 (74%)	11 (26%)		22 (51%)	9 (21%)	9 (21%)	3 (7%)	18 (42%)	
Smoking				1.00						0.12
Current smoker	22 (100%)	18 (82%)	4 (18%)		14 (64%)	3 (14%)	4 (18%)	1 (5%)	7 (32%)	
Ex-smoker	33 (100%)	26 (79%)	7 (21%)		14 (42%)	10 (30%)	7 (21%)	2 (6%)	19 (58%)	
Never smoked	133 (100%)	106 (80%)	27 (20%)		69 (52%)	30 (23%)	21 (16%)	13 (10%)	54 (41%)	
Immunosuppressed or receiving steroids				0.58						0.32
No	196 (100%)	154 (79%)	42 (21%)		98 (50%)	44 (22%)	35 (18%)	19 (10%)	84 (43%)	
Yes	4 (100%)	4 (100%)	0 (0%)		1 (25%)	2 (50%)	1 (25%)	0 (0%)	3 (75%)	

https://www.medrxiv.org/content/10.1101/2020.06.08.20120584v1

Birmingham HCWs

Respiratory infection

OPEN ACCESS

ORIGINAL RESEARCH

SARS-CoV-2 seroprevalence and asymptomatic viral carriage in healthcare workers: a cross-sectional study

Adrian Shie… Sian Jossi,[3] Erin Aldera,[4] Joel D Allen… Bosworth,[2] Lyndsey A Dunbar,[1] Daniel Ebar… nna Gray,[2] I Michael Kidd,[6] Golaleh Mc… ey,[7] Joanna O'Neill,[2] Danai Papa… on,[8] Megan Richter,[1] Eloise M W… nabe,[5,9] Celina Whalley,[8] Agnieszka E Zielinska,[4] Max Crispin,[5] David C Wraith,[1,10] Andrew D Beggs,[8] Adam F Cunningham,[3] Mark T Drayson,[1,10] Alex G Richter[1,2]

Birmingham
545 HCWs

For numbered affiliations see end of article.

Correspondence to
Professor Alex G Richter, Clinical Immunology Service, University of Birmingham College of Medical and Dental Sciences, Birmingham B15 2TT, UK

ABSTRACT

Objective To determine the rates of asymptomatic viral carriage and seroprevalence of SARS-CoV-2 antibodies in healthcare workers.

Design A cross-sectional study of asymptomatic healthcare workers undertaken on 24/25 April 2020.

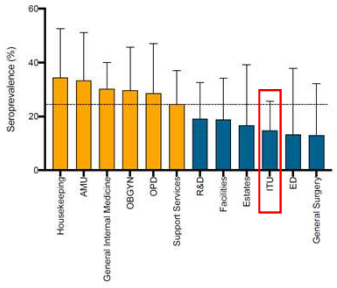
Setting University Hospitals Birmingham NHS

Key messages

What is the key question?

https://thorax.bmj.com/content/thoraxjnl/early/2020/08/28/thoraxjnl-2020-215414.full.pdf

Birmingham HCWs - seroprevalence



24% - 4x the community

	RR Compared to ICU
ICU	1.0
housekeeping	2.34 CI 1.07-5.01, p=0.03
acute medicine	2.25 CI 1.04-4.86, p=0.04
general internal medicine	2.05 CI 1.08-4.05, p=0.03

https://thorax.bmj.com/content/thoraxjnl/early/2020/08/28/thoraxjnl-2020-215414.full.pdf

ONS – PCR surveillance

Staying at home	1
Working outside home	2.49 (1.4-4.5)
Non-patient facing work	1
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Contact with hospital – personally	2.20 (1.1-4.2)
Contact with hospital – household member	1.99 (0.9-4.1)

61% of +ves asymptomatic

https://www.medrxiv.org/content/10.1101/2020.07.06.20147348v1

medRxiv BMJ Yale

Community prevalence of SARS-CoV-2 in England: Results from the ONS Coronavirus Infection Survey Pilot

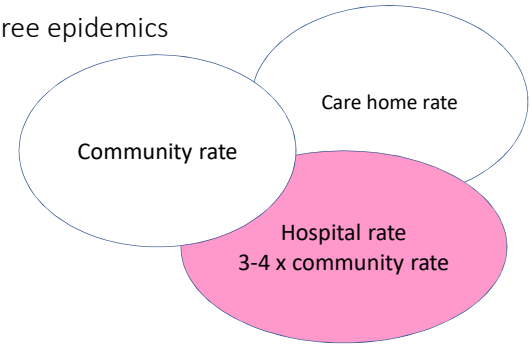
Infection rates

HCW vs community

PCR		
ONS		4x
Serology		
UCL	45 vs 15%	3x
Birmingham	24 vs 6%	4x
Oxford	11% vs 6%	2x

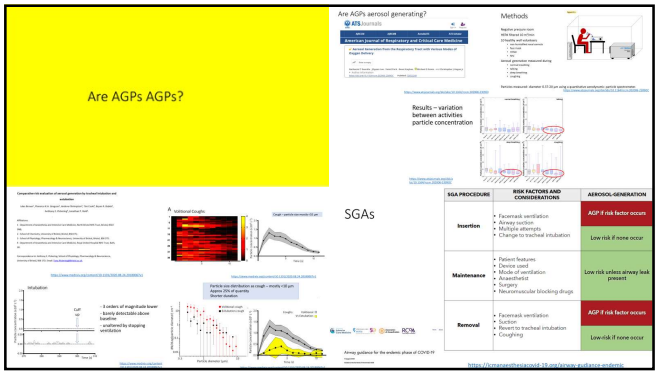
Anaesthesia and ICM under-represented
- HCW infection
- Deaths

Three epidemics



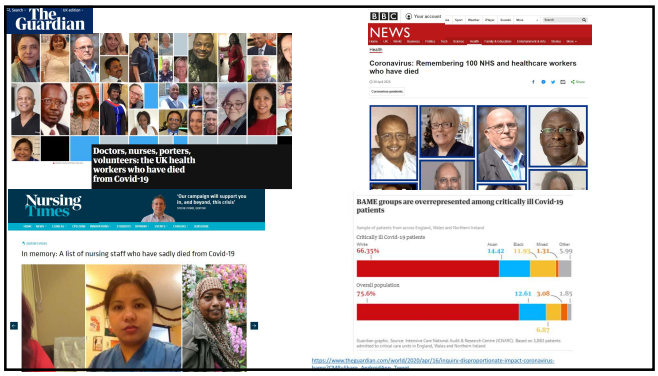
Waning antibodies

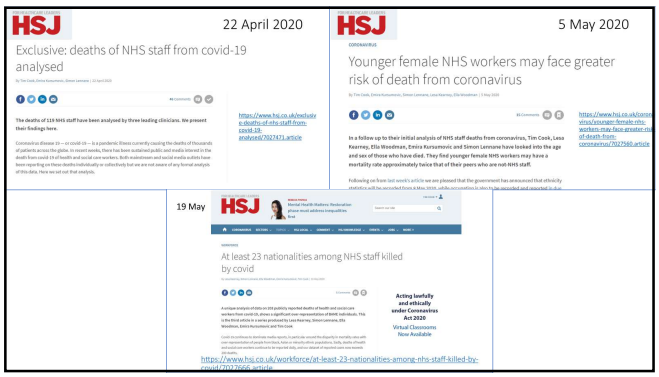
- wane after 3-4 months
- reinfection possible
- survived is not untouchable



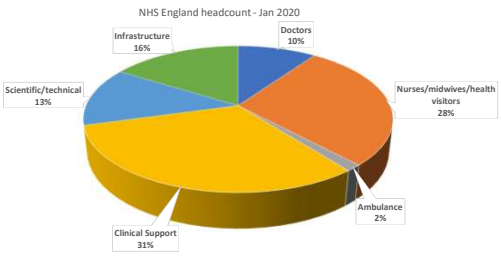
Healthcare staff deaths

Simon Lennane	GP, Ross on Wye
Emira Kusmurovic	Health Service Research Centre Fellow, RCoA
Lesa Kearney	Teaching Fellow, Kings Hospital
Ella Woodman	Physiology Undergraduate



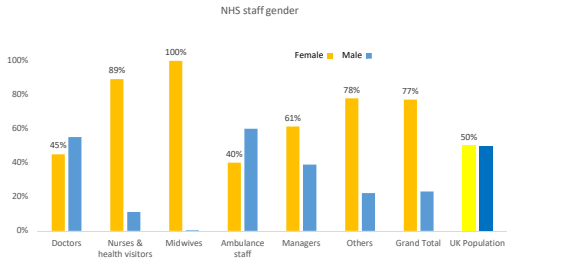


NHS England Headcount – Jan 2020



https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/january-2020

NHS gender: 77% female

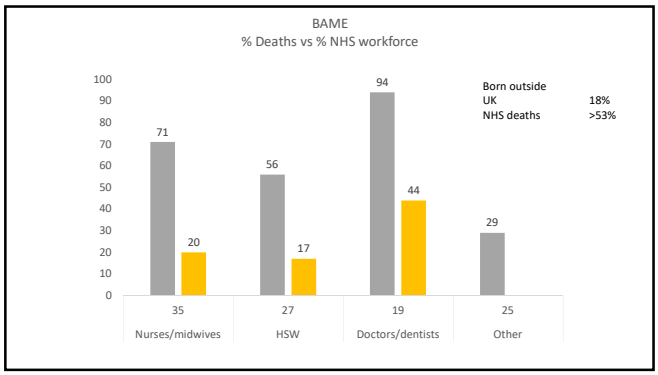


https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/september-2018

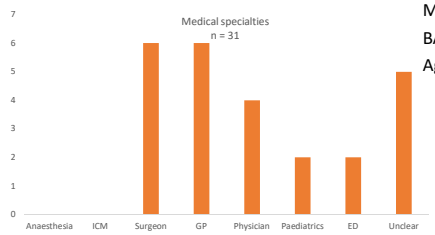
NHS workforce - % BAME (2018)

All	**21%**
Nurses	20%
HSWs	17%
Doctors	44%
Born outside UK	**18%**

https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/september-2018

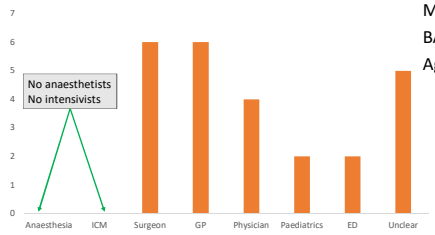


May - 31 doctors



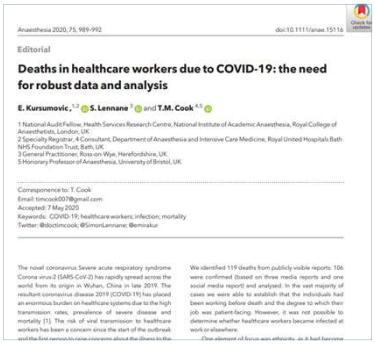
Male	96%
BAME	96%
Age	50-63 (median 62)

May - 31 doctors



Male	96%
BAME	96%
Age	50-63 (median 62)

Doctor deaths



Anaesthesia 2020, 75, 989-992 doi:10.1111/anae.15116

Editorial

Deaths in healthcare workers due to COVID-19: the need for robust data and analysis

E. Kursumovic,[1,2] **S. Lennane**[3] and **T.M. Cook**[4,5]

1 National Audit Fellow, Health Services Research Centre, National Institute of Academic Anaesthesia, Royal College of Anaesthetists, London, UK
2 Specialty Registrar, 4 Consultant, Department of Anaesthesia and Intensive Care Medicine, Royal United Hospitals Bath NHS Foundation Trust, Bath, UK
3 General Practitioner, Ross-on-Wye, Herefordshire, UK
5 Honorary Professor of Anaesthesia, University of Bristol, UK

Correspondence to: T. Cook
Email: timcook007@gmail.com
Accepted: 7 May 2020
Keywords: COVID-19; healthcare workers; infection; mortality
Twitter: @doctimcook; @SimonLennane; @emirakur

The novel coronavirus Severe acute respiratory syndrome Corona virus-2 (SARS-CoV-2) has rapidly spread across the world from its origin in Wuhan, China in late 2019. The resultant coronavirus disease 2019 (COVID-19) has placed an enormous burden on healthcare systems due to the high transmission rates, prevalence of severe disease and mortality [1]. The risk of viral transmission to healthcare workers has been a concern since the start of the outbreak

We identified 119 deaths from publicly visible reports: 106 were confirmed (based on three media reports and one social media report) and analysed. In the vast majority of cases we were able to establish that the individuals had been working before death and the degree to which their job was patient-facing. However, it was not possible to determine whether healthcare workers became infected at work or elsewhere.

Anaesthetist/Intensivist safety

1. Better PPE
2. Better behaviours
3. AGPs are not aerosol generating?
4. Infection risk burnt out before ICU?

Is the population safe?	No (age)
Are hospitals safe	No (keep the virus out)
Are anaesthetist and intensivists safe?	Yes (With present protection)n

Thank you

timcook007@gmail.com
@doctimcook