Technical Advisory Cell: Summary Brief

13 May 2020

Top line Summary

Reproduction ratio

- A consensus of Rt = 0.7- 1 for Wales was agreed at SPI-M meeting (11/5).
- It was agreed that the Rt value is similar across the 4 nations of the UK. Whilst it is almost certain to be under 1, it could be close to it.
- It is the consensus view of SPI-M-O that the overall reproduction number has increased slightly, when compared to last week. This is because the number of cases in the community is decreasing while the number in, or seeded by, care homes or hospitals remains broadly flat. As a result, hospital or care home cases represent a higher proportion of total cases. This means that the rate at which the overall epidemic is shrinking has slowed.

Short-term forecasts

- Short-term indicators estimate that cases, hospital admissions, and deaths are expected to decline over the next three weeks.

Estimate of prevalence and incidence of Covid-19 in UK

- Emerging community swabbing data collected from an ONS pilot between 26th and 8th May suggests that 136,000 people in England (confidence interval 76,000 to 225,000) would have swabbed positive with SARS-CoV-2 on 8th May.
- Consensus for incidence from SPI-M remains uncertain, with estimates ranging from 10,000 – 40,000 new infections per day. Uncertainty in this range is primarily due to differing assumptions on the proportion of infections that are asymptomatic; as further community surveys of swabbing and serological data become available, this uncertainty will reduce.

Adherence to current measures

- Most people in Wales (and the UK/GB) continue to follow the social distancing guidelines.
- From the data available it shows that many are complying with social distancing measures, it is estimated to be around 70% and some information (such as ONS survey data (subjective)) suggests it could be higher.
- Mobility data shows increases in the UK and in Wales in recent weeks that is in line with traffic data. However the survey based data shows those who state they are compliant remaining unchanged.

- **The mobility data shows increases in movement.** The Apple mobility data and Google mobility data shows increases in some categories for Wales, in line with the rest of the UK and is consistent with increases in traffic (from monitoring points).
- Changes in the mobility data may not mean similar changes in compliance. For example recent opening of some shops may results in more trips/higher mobility or warmer weather may mean people are more likely to be outdoors than indoors – however this needs further work to explore.

SAGE Paper on scientific view on testing strategy to reduce transmission in care homes

- SAGE considered a paper with an assessment of current evidence on the types of homes that are most vulnerable to C-19 outbreaks, optimal approaches to testing, and the potential value of other protection approaches.
- TAC agrees with the scientific advice outlined in the paper. The full paper has been shared to accompany this briefing document.

Wider modelling developments

- A new version of the UK level Reasonable Worst Case has been commissioned by UKG Cabinet Office.
- We are continuing work to develop 'circuit breakers' with four nations and SPI-M. These are indicators to give an 'early warning sign' that COVID-19 cases are increasing exponentially again. Initial work provided as part of the May Day review is included in the annex.
- We are developing options for a policy model for Wales with academic partners in Cardiff and Swansea, as well as modelling the economic and health outcomes associated with the 'four harms' from covid-19. Whilst this work is developed, we have approached Scottish Government to run the Imperial College model for Wales. The results of the first run of the model for Wales is included in the annex, and allows for comparison with countries across Europe. The model requires supercomputers to run and takes approximately 3 days to complete each run.

University Offers of Support

- TAC has been grateful for the continued engagement of colleagues from Higher Education Institutions across Wales in supporting the response to COVID-19.
- Universities across Wales have been provided support on large scale data linkage, super-computing expertise and technology to undertake complex modelling tasks. Discussions are also ongoing on how the potential capacity and capabilities of universities in Wales can contribute to the national testing plan.

Research

- There are currently 1494 Welsh patients recruited to COVID-19 urgent public health studies, an increase of 375 in last 7 days. (Eight total UPH studies open and recruiting in Wales).

New evidence of survival of SARS-CoV-2.

- New data has been shared by the US Department of Homeland Security on virus survival on surfaces and in aerosol. The data is not yet peer reviewed but is from a laboratory with a strong international reputation.

- Data adds to the evidence that the virus is likely to be stable for long periods of time on indoor surfaces and in air.

- Decay rate on surfaces increases with higher temperature and humidity. There may likely be small benefits in operating buildings at a higher temperature and/or humidity where this doesn't cause significant thermal discomfort to occupants. Ventilation rates should not be reduced to achieve this.

- The virus is very likely to decay very quickly (a few minutes) in air and on surfaces when exposed to sunlight. This adds to the evidence that outdoor environments are highly likely to be a lower risk for transmission.

Possible additional interventions to address hospital transmission risks of SARS-CoV-2

- The SAGE sub-group on Environmental Modelling have identified areas where there is evidence to support improvements in infection prevention and control (IPC) with respect to transmission of SARS-CoV-2 in the hospital environment. Six areas have been identified where improvements in IPC practice could be made and suggested actions are proposed for each of these.
- There is a focus on risks and practicable actions relating to: transmission from contaminated surfaces; infectivity according to timing of symptoms; contamination in bathrooms/toilets; aerosolisation/environmental contamination of when removing PPE; healthcare workers who are COVID-19 test positive; and hand drying. (Further detail in Annex 1)
- A gap analysis (comparing the recommended actions with existent guidance) is proposed, to inform where current IPC guidance needs to be updated/strengthened and implemented.

NHS Performance

Hospital data as reported 12 May:

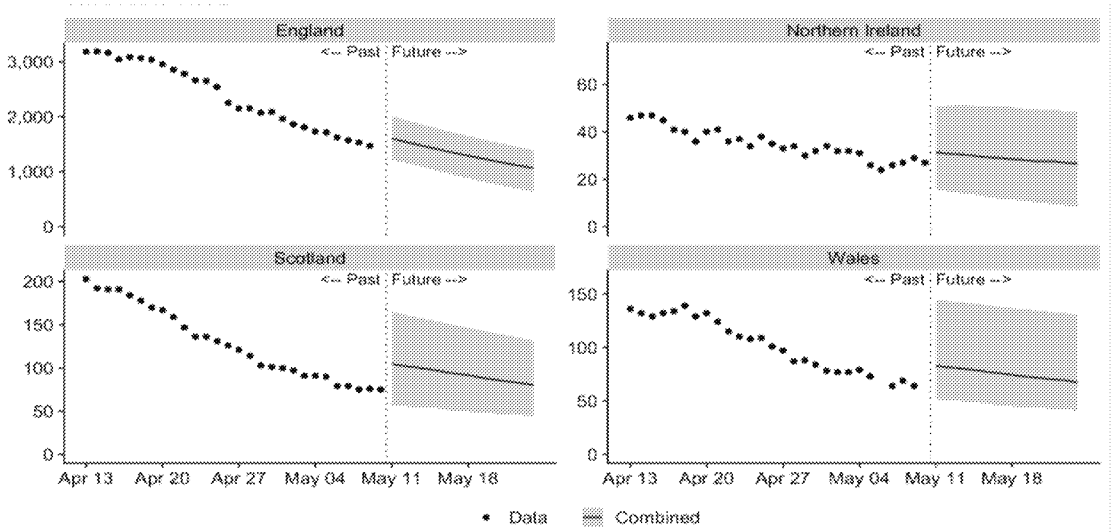
- The total number of hospital reported confirmed Covid-19 patients in Welsh ICU peaked on April 18 (139) and is now below half of this peak number (58).
- Of the 127 patients in L3 ICU in Wales, 46% are confirmed Covid-19 cases, 11% are suspected cases and 43% are non-Covid patients.
- All L3 ICUs are at less than 50% occupancy.
- The 7-day average daily values for overall case numbers, Covid-related hospital admissions, Covid-related ICU admissions, L3 ICU occupancy, and PHW-reported deaths all indicate the past seven days have improved overall over the previous 7-day period. However, total Covid-related hospital discharges are slightly lower.
- Of the 5189 occupied beds in NHS Wales (56% of total available), 12% are confirmed Covid-19 patients and a further 6% are suspected pending confirmation.

Annex 1: Additional Information

COVID-19 short-term indicators: 11th May 2020 update

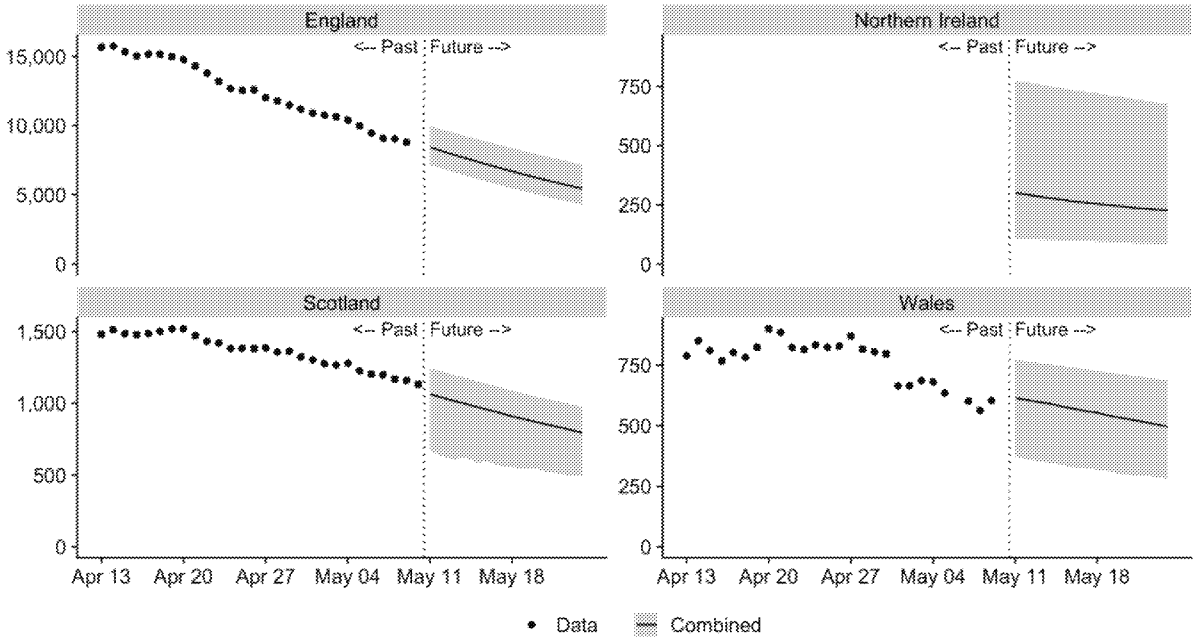
ICU beds occupied

- The total number of Intensive Care Units in hospitals occupied on any given day are forecast to continue decreasing in the four UK nations.



Hospital Bed Occupancy

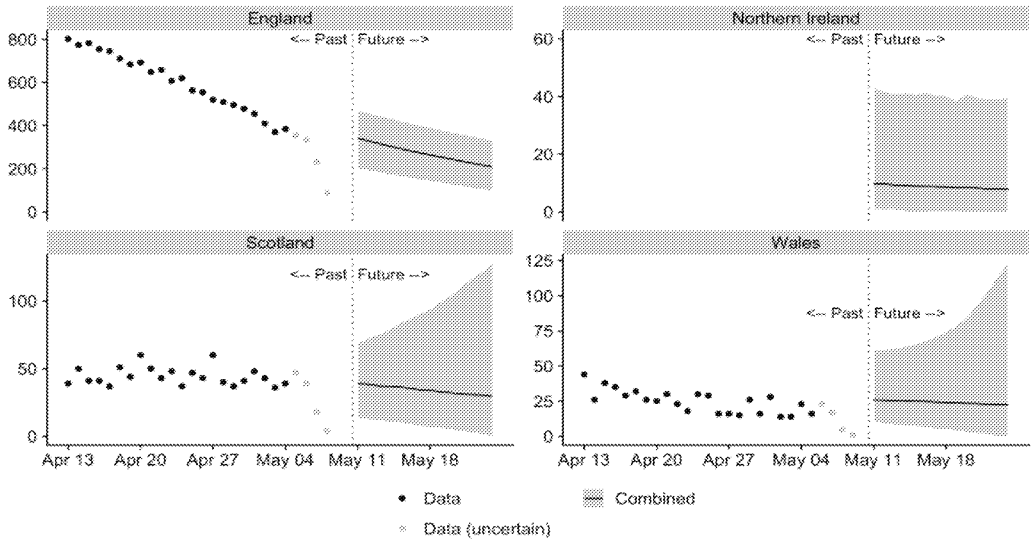
- The forecasts predict that hospital bed occupancy on any given day will also continue to decline for England, Northern Ireland, Scotland and Wales in May.



Hospital and community deaths (by date of death)

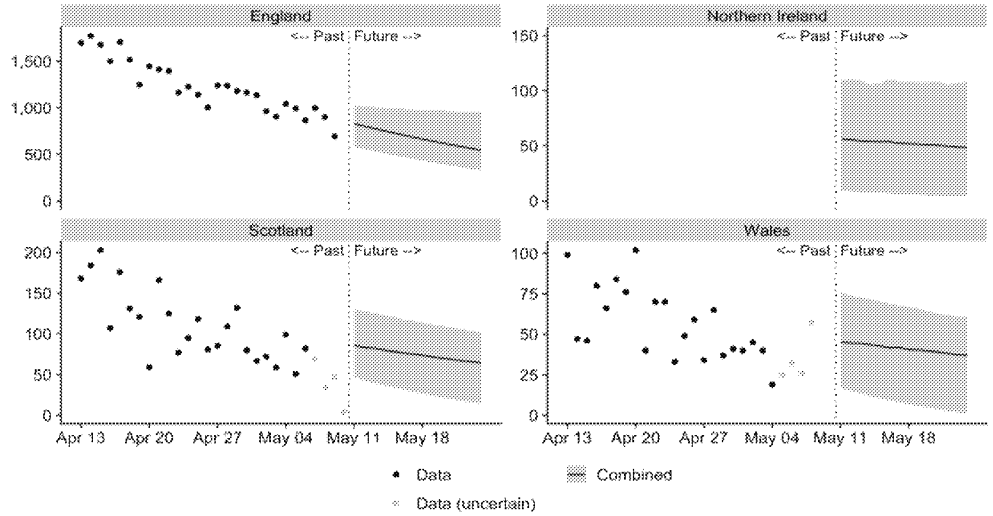
- The forecasts for England, Northern Ireland, Scotland and Wales predict that the number of daily deaths of those infected by COVID-19 will continue to decrease.

- Note that the Wales value includes confidence intervals that show an exponential growth. This is due to the way the confidence intervals of the various forecasts overlap and are then combined to get a consensus forecast. The upper confidence interval for a single academic group's forecast gets wider the further it goes out in to the future. This is much wider than the other forecasts and skews the upper section of the confidence interval for the combined forecast. The median prediction for all the models are either a slight downward or flat trend for deaths in Wales.



New and newly confirmed patients in hospital

- The forecasts for all four nations in the UK suggest that the number of new and newly-confirmed patients in hospital will continue to decrease throughout May.



Reasonable Worst Case

- The Reasonable Worst Case (RWC) is a scenario developed by the UKG Cabinet Office and modelled by SPI-M to enable effective planning across the UK Government. It is a worst-case scenario and is not intended to follow current real data. It is intended to show the maximum reasonable pressures that may occur.

- The Welsh Government adopted the previous RWC for planning purposes across multiple sectors.

- Cabinet Office provided this scenario to UK Government ministers, however did not provide an opportunity for Welsh Ministers to consider.

- Our current understanding is that the UK Government is planning to use the results of the RWC for planning purposes. Scotland and Northern Ireland are also considering whether any amends are required for their countries.

- The RWC policy scenario being considered by SPI-M:

    - Current measures are kept in place until 7th May, assuming R in the community is only just below 1.
    - At that point, policy measures are loosened, but too far, increasing R to 1.7.
    - This is maintained for 4 weeks. This takes into account that key indicators of direct impact would not be measurable for three weeks and that reintroducing legislation would take a few days.
    - Existing lockdown measures will be established for the next 6 weeks, with two three week reviews. This takes us up to the 3 month mark.
    - Note: The shielded remain shielded for the duration of the model.

- It is important to note that this does not specify in what way the social distancing measures will be amended either as a result of policy changes or deteriorating public compliance, but is sufficiently pessimistic to develop a reasonable worst case and support local planners.

- The assumption that Rt will rise to 1.7 (average for the UK) has been advised to SPI-M, and the model will be run on a number of different R0 assumptions.
- Once we have clarity on this new RWC we will be able to model it for Wales. It is likely that an Rt value of 1.7, even for four weeks, would produce a rapid increase in cases, hospital activity and deaths.

Imperial model for Wales, run by Scottish Government

- We established a Four Nation group for discussing technical modelling queries and to try and work in coherence across the Four UK Nations. Scottish Government colleagues have kindly run the imperial model for Wales, allowing us to better consider international comparison. The results below are the first set of analyses and should be treated with caution.

- The model is modified by removing the UK entry in the list of European countries and replacing with England, Scotland, Wales and Northern Ireland. Sensitivity analysis has not be undertaken to assess how this alters the sampling behaviour with the additional countries and data series, and may result in not being comparable to the IC model reported values for other countries. Smaller nations are included in the IC model (Denmark, Norway), and although sampling will likely be driven by larger populations, it appears to have not to have skewed the results for these nations.

- Figure 1 sets out estimates of Rt as of the 8 May. This shows based on the IC code run that there are lower Rts in England and Wales and higher in NI and Scotland. These Rts are modelled based on actual data and the estimated impact of lockdown.

- Within the UK there appears to be (statistically) significantly different between Wales and Scotland, and England and Scotland. Significant differences are identified from where the confidence intervals (blue lines) do not overlap.

Figure 1: Estimate of Rt as of 8 May

Circuit breakers

- In order to monitor any future easements of measures, requirements and restrictions, work is underway to consider the 'trigger points' to determine if measures may need to be re-imposed. These trigger points would also inform whether additional restrictions are required that are not currently in place.

- As knowledge about disease transmission increases (for instance the contribution of children, the contribution of fomites vs. aerosols), more precise measures may be considered.

- Underpinning each of the circuit breakers there will be an NHS layer that will inform national or local actions, dependent on the level and trend observed (in effect an escalation / de-escalation approach similar to that currently used in Emergency Departments). For instance if critical care capacity in a DGH is 40 beds, as part of the all Wales 180 (there may be extreme surge beyond that point), and COVID patients occupy 20 with an increasing trend then elective and non-essential activity may immediately cease to provide an immediate capacity buffer.

- There is no single indicator that could provide an understanding of whether measures should be amended immediately. Indicators that are available also vary in terms of timeliness. These indicators are also likely to be reviewed, as new data is made available.

- In the event that a circuit breaker indicator is breached, it should also be considered that there will be a:
  - three day lag from when the indicator is reported to legislation being in place and announcement of new measures.
  - five further days before the impact of the previous measures to be noticed, due to the incubation period of the virus.

- These indicators have been shared with SAGE and SPI-M, and were circulated as a paper for SPI M O on 11th May, with the ambition of informing indicators that may be suitable for monitoring covid-19 and may be adapted as part of a four nations approach.

- These indicators have also been shared with modellers from across the health and social care system in Wales and academic groups for comment.

- A consensus on circuit breaker indicators will be provided by the Technical Advisory Cell.

Indicators for consideration

1. If a reliable estimate of Rt (median) for the population of Wales is greater than or equal to 1.1.

This indicator considers the basic reproduction number of the virus. It should be presented to one decimal place with 95% confidence intervals where available.

Sources:
SAGE/SPI-M/WG/PHW. This has a two to three week lag in reporting and a consensus of multiple models is agreed. Currently only Wales level.

The aim of the suite of lockdown measures is to reduce the number of COVID cases. It is very likely that number of confirmed cases is much lower than the actual number of cases – there have been over 1000 deaths from covid so with an infection fatality rate of 1.4% this would imply there has been at least 100,000 cases while the number of confirmed cases is around 11,000.

This indicator may be updated in future iterations where Rt may be able to be higher – for example if there were accurate reporting of the number of cases; the number of cases was smaller; and test, track, and trace has sufficient coverage. We could also draw contextual information from the individual epidemics (community, nosocomial, social care). It may also be informative if future seroprevelance studies find a high prevalence of antibodies in the population.

2. If the doubling rate for new hospital admissions (all Wales community acquired) is shorter than 30 days and decreasing for consecutive measurements, and/or current occupancy for suspected and confirmed patients is above 1200.

This will be presented to one decimal place with 95% confidence intervals. For presentation purposes, where values are negative halving times will be presented.

Sources:
PHW. This is provided approximately once a week, and covers the time period to the previous day.

This may provide a more timely estimate than Rt. This may be amended to confirmed COVID cases once testing increases to include all suspected cases. This can be contextualised by the short-term forecasts provided by SPI-M which estimate a direction of travel for hospital admissions and bed occupancy.

3. If the total critical care bed occupancy (for COVID and non COVID patients) is above 180 and COVID numbers are increasing for 7 consecutive days.

This indicator considers the total occupancy of critical care. Critical care occupancy would only cover secondary care settings capable of critical care, and would not cover community or field hospitals.

Source:
Daily SitReps (which refer to the previous day).

Where there is an increase in the number of people in critical care there will be a reduction in staff to patient ratio and quality of care is assumed to be reduced. In Wales we can only safely staff up to 160-170 beds; when this is exceeded we will be using staff who have either not been trained or have not been working in that environment. Beyond 200-220 beds staffing ratios will then be impacted. Increase above 160 beds will increase the likelihood of extended lengths of stay due to suboptimal care and possibly increased mortality, beyond 220 that increases even further.

4. If the critical care occupancy for suspected and confirmed COVID patients above 120 and increasing for 7 consecutive days.

This indicator consider the total occupancy of critical care with COVID positive patients. It considers that if there is a higher risk of a COVID outbreak if there is a larger number of COVID patients. Critical care occupancy would only cover secondary care settings capable of critical care, and would not cover community or field hospitals.

Source:
Daily SitReps (which refer to the previous day).

Additional potential indicators to be considered

a. NHS staff absence, developing into staff absence more generally.

We have seen some analysis that staff sickness absence is a predictor of covid hospital admissions in health boards and are investigating whether this is a useful 'barometer' of the virus incidence. We wish to investigate the use of staff sickness absence as an early warning system but it may no longer be useful if we reach a saturation point where a large proportion of healthcare workers have had the virus and have some immunity.

This may also highlight the usefulness of measuring absence for other areas where this may be considered (e.g. teaching/ education staff).

b. Care homes

This may be too far down the care pathway to be a circuit breaker. However it should be factored into the conversation on monitoring the four harms.

c. Seroprevalence / Testing data

This indicator will need to be developed as test volume increases, and accuracy is sufficient to estimate Wales level prevalence.

d. ZOE – symptom study app data

Analysis of whether the Zoe data has sufficient coverage and sensitivity to provide reliable information is required.

Summary of SAGE Papers

SPI-M-O: Consensus Statement on COVID-19

- SPI-M-O's best estimate is that the overall reproduction number, Rt, is between 0.7 and 1.0 for the UK. While it is almost certain to be under 1, it could be close to it.

- It is the consensus view of SPI-M-O that the overall reproduction number has increased slightly. This is because the number of cases in the community is decreasing while the number in or seeded by care homes or hospitals remains broadly flat.

- As a result, hospital or care home cases represent a higher proportion of total cases. This means that the rate at which the overall epidemic is shrinking has slowed.

- Incidence remains uncertain, with estimates ranging from 10,000 – 40,000 new infections per day. Uncertainty in this range is primarily due to differing assumptions on the proportion of infections that are asymptomatic; as further community surveys of swabbing and serological data become available, this uncertainty will reduce.

- The reproduction number in the community is almost certain to be lower than R overall, possibly as low as 0.5-0.6, and key workers and their households are likely to represent a significant proportion of infections in the community.

- Hospital-acquired infections are estimated to make up more than 10% of new and newly diagnosed cases of COVID-19 in hospital, with extremely high variation between hospitals. NHS England data show 10-15% of new and newly confirmed hospital cases come from care homes, and it is estimated that a further 2-5% are from health and care workers. This implies that a minimum of 25% of new hospital cases are not acquired in the community. This is likely to be an underestimate as it does not include people who acquire COVID-19 in hospital, leave, and are then re-admitted, or people who acquire infection in outpatient departments. Nor does it account for infections spread in the community by healthcare workers

- Rt in hospital is difficult to determine, as it comprises multiple transmission routes: viral transmission from the community into hospitals and vice versa, between care homes and hospitals, as well as within hospital itself.

- Evidence on how the number of healthcare acquired infections is changing over time is relatively weak. That which is available, including from both England and Scotland, suggests that this number is broadly flat. There is increasing evidence that transmission among staff is responsible for a large proportion of these

infections. It is very likely that healthcare acquired infections are being seeded back into the community.

- Once cases of COVID-19 are within care homes, outbreaks can become very large. The most effective way to prevent deaths within care homes is to prevent outbreaks happening there in the first place. Over 60% of care homes have not reported an outbreak as yet, and the top priority should be to keep this proportion as high as possible.

- The current number of new infections per day remains uncertain. Emerging community swabbing data collected from an ONS pilot between 26th and 8th May suggests that 136,000 people in England (confidence interval 76,000 to 225,000) would have swabbed positive with SARS-CoV-2 on 8th May.

- Preliminary results from these swabbing surveys support the view that a significant proportion of infections in the UK are directly associated with health and social care workers

CO-CIN Paper: Case fatality in hospitalised patients after 23rd March 2020

- Work has been undertaken to identify any difference in case fatality from COVID-19 before and after 23rd March 2020 associated with age and comorbidity.

- Results indicate that fewer deaths are seen after 23rd March 2020 by both simple case count and in formal survival models.

Possible additional interventions to address hospital transmission risks of SARS-CoV-2

- After review of existing evidence, we have identified pertinent hospital environment associated transmission risks for SARS-CoV-2 that can be addressed. For each identified transmission risk, a brief context is provided and actions suggested.

- The Environmental Modelling Group suggests using a hierarchy of risk approach, to enable mitigation measures to be considered, both in terms of how the impact on the transmission routes and the level at which they are implemented within an organisation. Throughout, we indicate the controls as: (E) Eliminate, (S) Substitute, (En) Engineering/environment, (A) Administrative, (P) PPE.

1.Risk of transmission from contaminated surfaces should be recognised as a significant potential infection route

Context:

- Evidence from previous coronavirus outbreaks, supported by preliminary modelling for the SARS-CoV-2 outbreak within EMG suggests that the infection can be

transmitted by touching objects and there is a realistic possibility that this may be a significant route. Evidence to date suggests virus can persist on surfaces at a level that may pose a risk for up to 48 hours, and contamination has been found on surfaces in several hospital environmental sampling studies.

- The evidence suggests that cleaning with appropriate materials does significantly reduce virus survival, and so cleaning is likely to be a major factor in reducing risk of virus transmission.
- Coronaviruses can be efficiently inactivated by surface disinfection procedures with 62–71% ethanol, 0.5% hydrogen peroxide or 0.1% sodium hypochlorite within 1 minute. Other biocidal agents such as 0.05–0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate proved to be less effective. NHS guidance recommends use of combined detergent/chlorine products as these are single step/practicable options.
- Wang *et al* (2020) used quantitative real-time reverse transcription PCR (qRT-PCR) methods to confirm the existence of SARS-Cov-2 on 36 surfaces wiped with 1000 mg/L chlorine containing disinfectant. The authors did not find any SARS-Cov-2 RNA on the 36 surface samples after cleaning. The monitoring data in this study suggested that the strict disinfection and hand hygiene could decrease the hospital-associated COVID-19 infection risk of the staff in isolation wards.

Actions:

i. Increase frequency of surface decontamination, and especially of frequent touched sites – current NHS guidance says at least twice daily; we suggest that higher frequencies are required. (A)

ii. Alcohol or disinfectant wipes should be made widely available in hospitals, so that there is local capability for (frequent) decontamination of frequent touched surfaces (i.e. additional to Facilities directed cleaning). (A)

iii. Other mitigation approaches such as novel surface materials could be considered in high risk areas. For example alcohol release door plates have been shown to reduce contamination for bacterial pathogens and may be a viable option for reducing viral transmission. Innovations to reduce contact through devices such as automatic door opening and contactless operation of systems may also be useful for reducing transmission. It is important that any such measures focus on the priority areas of high touch sites rather than all surfaces and systems. (En)

2. Infectivity appears to be highest just before symptoms start/very early in symptomatic infection

Context:

- Available evidence suggests that viral load in patients (and so healthcare workers) is highest early during illness and possibly just prior to symptom onset. Higher viral load in patients is associated with greater environmental contamination. It is

plausible, therefore, that viral shedding and environmental contamination will similarly be higher at these times.

Actions:

i. Patients with suspected/possible COVID-19 need to be segregated, especially in admission/waiting and non-COVID areas. Mask usage should be emphasised for all suspected individuals. Ideally, segregation should be separate spaces, but there is also potential to use screens, for example to protect reception staff. (En/A)

ii. For patients with new onset symptoms, it is important to achieve isolation and instigation of contact tracing as soon as possible. (A)

iii. A high index of suspicion should be used to identify/test patients or healthcare workers with early COVID-19 (or repeat healthcare worker screening). (A)

iv. Ensuring good ventilation in admission/waiting areas is an appropriate precaution to minimise opportunistic airborne transmission risk. (En)

3. Excess contamination by SARS-CoV-2 in bathrooms/toilets

Context:

- While the infectivity of faeces remains unclear, SARS-CoV-2 can be detected in faeces and in/around toilets/bathrooms used by COVID-19 patients. Faecal shedding may therefore be a potential source of contamination, particularly in shared toilet facilities.
- In addition, a possible transmission route exists from aerosolised faecal matter when water trap seals (U-Bends) become empty as a result of pressure surges in the wastewater plumbing system due to heavy usage or evaporation due to underuse.
- While SARS-CoV-2 particles can be found in faeces, the infectivity/time course/transmissibility of virus in faeces is unclear and further work is required.
- Lidless toilets may pose a higher risk for aerosolisation of SARS-CoV-2 compared to putting lids down when flushing, evidence is required.

Actions:

i. Increased frequency/cleaning/surface decontamination of bathroom/toilets with chlorine-based disinfectants should take place, especially but not solely in COVID-19 areas. (A)

ii. There needs to be care over the disposal of faeces and subsequent equipment decontamination following use of commodes by (possibly) COVID-19 positive patients. (A)

iii. Empty water traps in sinks, showers, baths and toilets are possible and may pose a potential transmission route. Floor drains should be checked and refilled regularly. (En)

4. Potential for aerosolisation / environmental contamination of virus when removing PPE

Context:

- Recent data from a Wuhan hospital show that some clinical staff areas, including rooms where personal protective equipment was removed, had high environmental levels of SARS-CoV-2 levels; these levels became undetectable after better sanitization procedures were implemented. This issue is not mentioned in the current Infection Prevention and Control COVID-19 Management Checklist.

Actions:

i. Increased frequency/cleaning/surface decontamination of areas used to remove PPE with chlorine-based disinfectants should take place, where practicable timed to coincide with periods immediately after PPE removal by groups of staff. This is particularly pertinent for COVID-19 areas. (A)

ii. The importance of removing masks last of all when removing PPE, followed by thorough hand washing should be re-emphasised. (P)

iii. Ensure good ventilation of areas where PPE is removed, and consider adding air cleaning/disinfection devices to mitigate risk if the air is poorly ventilated. (En)

5.Undetected NHS healthcare workers who are COVID-19 test positive while still at work

Context:

- Data show a wide range of asymptomatic infection rates (2% to 25%) in screened healthcare workers. Recent NHS data suggest a rate of ~5% of HCWs are COVID-19 positive while at work. CDC has reported that 8% of the HCW COVID-19 cases for whom they had clinical data had not reported fever, cough, or shortness of breath. Also, recent environmental sampling in a Wuhan hospital showed that two areas with high footfall - the entrance to a shop and a site next to one of the hospitals - had high levels of SARS-CoV-2.

Action:

i. Need to remphasise the need for healthcare workers to be alert for subtle symptoms of COVID-19. (A)

ii. Use increased testing capacity to check for hidden/unsuspected COVID-19 in healthcare workers. (A)

iii. Healthcare workers should be assigned to work in rather than across hospital zones; this is especially pertinent with redesign NHS working practices, for example to divide hospitals into areas with patients and healthcare workers that are COVID-19 positive, COVID-19 positive or COVID-19 indeterminate. (S/A)

iv. Greater attention is needed by healthcare workers to social distancing, notably when not wearing PPE and in non-clinical areas. (A)

v. Consideration should be given to recommending the routine use of surgical masks by healthcare workers including in non-clinical areas. (P)

vi. Frequent cleaning of staff areas, including frequent touch points. (A)

vii. Limiting the density of healthcare workers e.g. better staggering of meal breaks. (A)

viii. Ensuring that staff areas are well ventilated as far as possible. (En)

6. Hand hygiene/drying

Context:

- The promoted healthcare hand washing technique includes an important paper towel step, in which hands and wrists are thoroughly dried. NHS guidance (and infection control teams) advise against the use of hand dryers in hospital clinical areas; clinical areas are not defined, however. It is clear that some hospital toilets, especially in communal areas, are used by patients, healthcare workers and visitors. Furthermore, hand dryers are prevalent in such hospital toilets.
- Hand hygiene methods may have a significant effect on hand contamination and subsequent surface contamination. Experiments conducted using a bacteriophage surrogate showed that substantially more contamination was found on touch surfaces and on volunteers' clothing following drying hands using jet air dryers compared with paper towels. Work has also shown jet dryers to cause significant surface and air contamination in bathroom environments.
- The risk of faecal excretion of SARS-CoV-2 is noted above.
- There are issues concerning the use of paper towels instead of hand dryers, including fire load risk of waste paper in public spaces, the risk of toilet blockage from paper towels, and supply continuity, which need to be considered.

Actions:

i. Paper towels should be used instead of hand dryers in toilets in all areas of hospitals. (A/En)

ii. Guidance on hand hygiene and drying should be clearly displayed in all public toilet areas as well as staff areas. (A)

iii. Management of paper towel waste needs to be considered carefully as this is potentially contaminated. (A)

iv. Make doors to exit toilets "no touch" as far as possible so that people do not recontaminate hands on door handles touch plates. (En)

- It is noted that application of these approaches will vary in hospitals according to area/building/site, not least given the wide range in risk according to the prevalence of (risk of contact with) SARS-CoV-2. Redesign of NHS working practices, for example to divide hospitals into areas with patients and healthcare workers that are COVID-19 positive, COVID-19 negative or COVID-19 indeterminate, will mean that differing infection prevention and control risk assessments are required according to location.

- These risk assessments need to take account of each specific environment, including considering the original design/intended function of each location. A simple example here is using a corridor as a patient waiting area. Ventilation/airflows in a corridor may disperse virus aerosols posing an infection risk, including to others who have to use the corridor. Thus, the corridor may not have been originally designed to manage such risks.

- It is noted that such redesign of NHS working practices/hospitals may only achieve partial segregation of (COVID-19 positive, COVID-19 negative or COVID-19 indeterminate) patients and healthcare workers. Some healthcare workers may pass between the different areas and patients from these separate areas may be required to attend a common department/service e.g. radiology.

- In general, physical distancing and avoidance of high density groups (including healthcare workers) will be required to minimise risks of virus transmission. For example, no or limited visitors, and consultations by phone or video should be practised where possible.

SPI-M-O: Planning scenarios and current estimates of severity and length of stay

- This technical paper provides important statistical parameters to support more accurate future modelling. It will be used to inform modelling work in the coming weeks.

Paper shared by the US Department of Homeland Security on virus survival on surfaces and in aerosol (ANNEX)

- *Survival on indoor surfaces*. At 24° C the half-life for SARS-CoV-2 dried onto stainless steel in simulated saliva was 14.5 hours at 20% relative humidity (RH), 7.1 hours at 60% RH and 8.3 hours at 80% RH demonstrating the stability of the virus in indoor environments. Increasing temperature and RH decreased the half-life (1.1 hours at 35° C and 65% RH). SARS-CoV-2 is stable on surfaces in indoor environments not exposed to sunlight.

- A model within the report suggests linear relationships with temperature and humidity in the range 20-35°C. There may likely be some small benefits in

maintaining buildings at a warmer temperature (e.g. increasing from 20-22°C to around 26°C) where this doesn't cause significant thermal discomfort. However ventilation rates should not be reduced to achieve this. EMG believe that the evidence for improving ventilation in poorly ventilated buildings in order to dilute and remove bioaerosols is stronger than that for altering temperature and humidity. Hence changing building temperatures or humidity should only be considered where it can be achieved while still maximising the fresh air ventilation.

- *Survival on surfaces exposed to artificial sunlight* - Solar radiation rapidly reduced viral stability on stainless steel surfaces with virus half-lives of 2 minutes in high intensity full sunlight, 3 minutes in half sunlight and 4 minutes in quarter sunlight compared to ca10 hours in the indoor environment. Outdoor surfaces exposed to sunlight are lower risk for virus transmission and sunlight may be effective as a disinfectant for potentially contaminated non-porous surfaces.

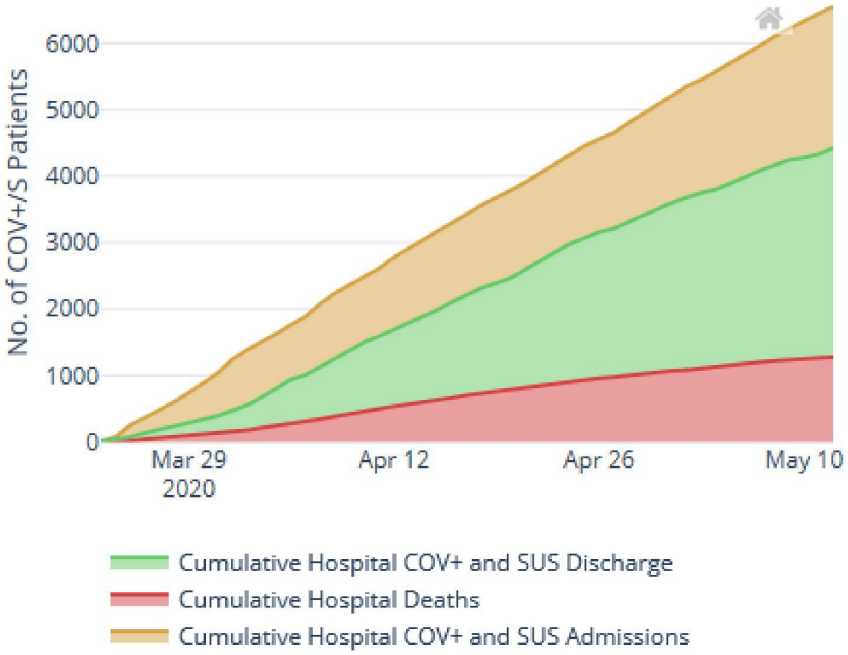
- *Survival in indoor aerosols.* No decay within an hour at 20° C at a range of relative humidities in the dark. Some evidence for increased decay at 30°C and 70% RH. Dstl have also generated limited data under dark conditions showing similar behaviour. SARS-CoV-2 is stable in the aerosol state in indoor environments

- *Survival in outdoor aerosols.* Full intensity sunlight rapidly inactivated SARS-CoV-2 in aerosols (half-life 2-3 minutes). Moderate intensity sunlight also rapidly inactivated viral aerosols with slightly longer half-lives (4-6 minutes). This shows that the outdoor environment will be a lower risk for aerosol transmission, although it should be noted that this timescale will not significantly influence close range (less than 2m) risk. Outdoor SARS-CoV-2 aerosols exposed to sunlight are rapidly inactivated. The outdoor environment presents a far lower risk for long range viral aerosol transmission due to rapid inactivation and dilution of the virus.

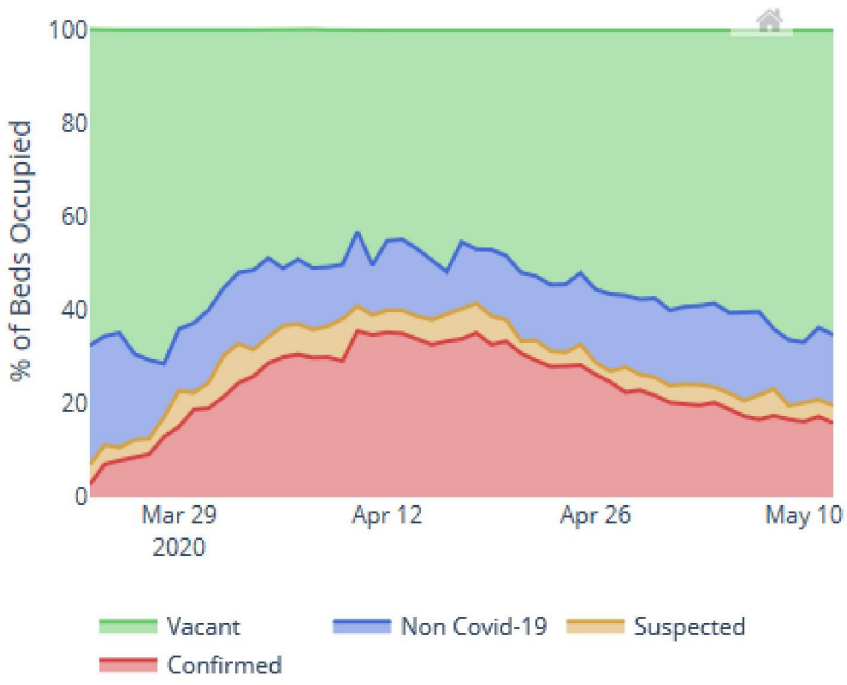
- *Intensity of sunlight.* No data is provided on the UV levels used for moderate and high intensity sunlight. It is assumed that these values correspond with the UV intensity scales used in weather forecasting where moderate intensity is defined as a UV index reading of 3 to 5 (meaning moderate risk of harm from unprotected Sun exposure) and full intensity is a UV index reading of 6 to 7 (meaning s high risk of harm from unprotected Sun exposure).

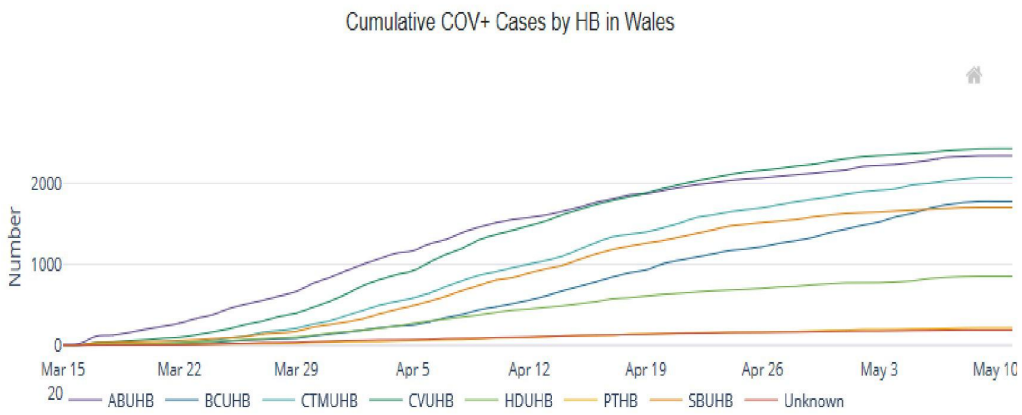
NHS Performance

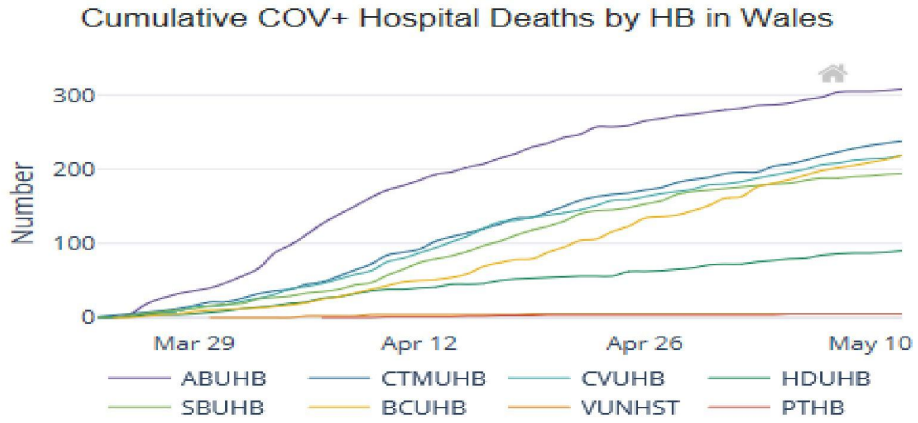
Cumulative Number of Hospital COV+ and SUS Admissions, Discharges and Deaths in Wales



NHS Wales ICU (L3) Beds Capacity







REGION	Cases		Deaths	
	Number	Per 100k Pop.	Number	Per 100k Pop.
Confirmed (11/05/20)				
UK	223,060	334.7	32,065	48.1
England	136,873	244.5	28,657	51.2
London	25,980	289.1		
Scotland	13,627	249.9	1,857	34
NI	4,149	220.5	435	23.1
Confirmed (12/05/20)				
Wales	11,573	368.7	1,132	36.1
ABUHB	2,340	395.8		
HDUHB	852	220.9		
SBUHB	1,702	437.1		
CTMUHB	2,070	464.9		
CVUHB	2,426	488.7		
BCUHB	1,777	254.5		
PTHB	216	163.1		