Summary of SAGE advice of segmentation

15th October 2020

Summary

This short note considers the scientific aspects relating to a strategy that would segment the population into broad age and risk groups, for example adding further restrictions to those over 60 or who are otherwise identified as vulnerable, while not attempting to restrain transmission in younger people. This stands in distinction from a policy of shielding of those who are clinically extremely vulnerable, as took place earlier in the year. Nor should this paper be taken as suggesting that older people should not take precautions to avoid becoming infected.

Such a strategy would not be viable because:

- It would not be possible to prevent the virus spreading from younger people to older people.
- A very large proportion of the population would need to withdraw from daily life for many months, which would have profound negative effect on them.
- An uncontrolled epidemic in younger age groups would have dire consequences for the NHS as well as having unknown long term effects in those infected.
- We do not know if long term immunity results from infection with SARS-nCOV-2
- Even if high levels of immunity could be achieved with in the younger age group, it is almost certain that a further epidemic wave in older people would happen occur once segmentation ended.

There are substantial legal and ethical dimensions associated with such a strategy, which are out of scope of this document.

Viability of segmenting the population

There has been a clear pattern from around the world of incidence rising first in young people, before spreading into older age groups. This is now being repeated in the UK. No country has managed to contain their epidemic within lower risk age groups. Despite measures to shield the vulnerable in spring, COVID-19 was involved in the deaths of 15,646 people in care home residents up to 2nd October[1].

This is a result of there being substantial interaction between older people and all other age groups, as demonstrated by studies of contact patterns[2]. These results mean that policies to segment the population by age, relaxing restrictions for younger groups while restricting them for older groups, are very likely to fail.

Some of this contact between age groups happens at home, including in multigenerational homes. There are an estimate 1.8 million such homes[3]. This varies substantially between ethnic groups. Only 8% of households containing at least one white person aged over 70 also contains someone aged under age 50. By comparison, the corresponding figures are 67% for Bangladeshi, 60% for Pakistani and 36% for Black African people[4].

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[1] ONS (2020) Deaths registered weekly in England and Wales, provisional: week ending 2 October 2020
[2] SAGE 48: SPI-M-O Statement on population segmentation by age group
[3] Cambridge Centre for Housing and Planning Research (2018) Multigenerational living: an opportunity for UK house builders?
[4] ONS (2020) Ad hoc request - Households by age composition and ethnicity, UK, 2018.

To be viable as a strategy, there would need to be complete separation between those over 60 and the rest of the population, as even a small leak would cause many illnesses and death when prevalence is high. No country has managed to achieve anything like a complete separation.

For a truly successful segmentation policy, we would need to protect both those in the high-risk segment and those who have regular close contact with them (regardless of their age), including those they live with or provide them with formal or informal care. This would prevent these people from being employed outside their home or attending educational settings. 3.4 million people age 60 or over and 1.3 million aged 65 or over are employed[5]; 20.2% of NHS staff are 55 or over[6], as are 25% of people working in the care sector[7]. A major study in 2017-18 showed that 24% and 13% of contacts amongst 60-64 and 65-69 years respectively happened at work.[8] Although some of these could be avoided by working from home, many could not.

Impact on high risk groups

For a segmentation strategy to be successful, it would need to be maintained for many months by a group which is much wider than in spring. This comes with its own risks. Shielding advice is challenging to follow and prolonged shielding may have negative mental and physical health consequences, so it is not an intervention that could be advised lightly.

Impact on other groups

Although younger people are at relatively lower risk, it is not possible to precisely predict in advance who will be severely affected by the virus. A quarter of COVID-19 hospital admissions have been in those aged 60 or below, along with 7% of deaths[9]. An unconstrained epidemic in this age group would have dire consequences for the NHS and is highly likely to create an enormous burden of COVID-19 hospitalisations, with both large numbers of COVID-19 deaths and the knock-on result of non-COVID-19 deaths across all age groups. Furthermore, while the profile of longer-term consequences of contracting COVID-19 are unclear, there is emerging evidence that "long COVID" is a problem for some people who do not require hospitalisation.

Longer term considerations

The theoretical benefit of such a strategy would be to build up immunity in the younger age groups of the population without waiting for a vaccine or improved treatments. However, this would rely on there being long-lasting immunity resulting from infection. It is not yet possible to determine how long immune responses last or how effectively they prevent reinfection. There have been well-documented instances of people being infected twice.

Furthermore, even if a large proportion of those under 60 became immune to re-infection (which would require many people to be willing to expose themselves to COVID-19), true herd immunity requires a build-up of protection in all parts of society. Once the segmentation policy ended, it is almost certain that a further wave of the epidemic would take place, predominantly in the over 60s.

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[5] ONS (2020) Labour Market Status By Age
[6] NHS Digital (2019) NHS Workforce Statistics
[7] Skills For Care (2019), The adult social care sector and workforce, England and regional geographical areas
Comment added for release: Please note that Skills for Care have since released the 2020 report, and removed the 2019 report referenced. The equivalent statistic from the 2020 report is 27%, and can be found *here*.
[8] *Reference added for release:* Klepac, P., Kucharski, A., Conlan, A., Kissler, S., Tang, M., Fry, H. & Gog, J (2020) Contacts in context: large-scale setting-specific social mixing matrices from the BBC Pandemic project
[9] CO-CIN: COVID-19 n-patient demographics after 1 August 2020 compared with whole CO-CIN cohort, 16 September 2020; *additional reference added for release:* Gov.uk Coronavirus (COVID-19) dashboard