

# Infection Prevention & Control in care homes: taking account of asymptomatic / pre-symptomatic transmission

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## **Aim of session**

- Quick review of current PHE / PHS guidance
- Explain transmission of COVID-19 in care homes
- Explanation of effective measures to prevent and control transmission and infection

# Current guidance – PH England

## 3.1 Routes of transmission

Infection control advice is based on the reasonable assumption that the transmission characteristics of COVID-19 are similar to those of the 2003 SARS-CoV outbreak. The initial phylogenetic and immunologic similarities between COVID-19 and SARS-CoV can be extrapolated to gain insight into some of the epidemiological characteristics.

## 3.2 Incubation and infectious period

The incubation period is from 1 to 14 days (median 5 days). Assessment of the clinical and epidemiological characteristics of COVID-19 cases suggests that, similar to SARS, most patients will not be infectious until the onset of symptoms. In most cases, individuals are usually considered infectious while they have symptoms; how infectious individuals are, depends on the severity of their symptoms and stage of their illness.

The median time from symptom onset to clinical recovery for mild cases is approximately 2 weeks and is 3 to 6 weeks for severe or critical cases. There have been case reports that suggest possible infectivity prior to the onset of symptoms, with detection of SARS-CoV-2 RNA in some individuals before the onset of symptoms.

# Current guidance – PH England

## Annex B: Definitions of COVID-19 cases and contacts

- **Possible case of COVID-19 in the care home:** Any resident (or staff) with symptoms of COVID-19 (high temperature, new continuous cough, and/or a loss of, or change to, sense of smell or taste), or new onset of influenza like illness or worsening shortness of breath.
- **Confirmed case of COVID-19:** Any resident (or staff) with laboratory confirmed diagnosis of COVID-19.
- **Infectious case:** Anyone with the above symptoms is an infectious case for a period of 7 days from the onset of symptoms.
- **Resident contacts: Resident contacts are defined as residents that:**
  - Live in the same unit / floor as the infectious case (e.g. share the same communal areas).
  - or
  - Have spent more than 15 minutes within 2 metres of an infectious case.
- **Staff contacts:** Staff contacts are care home staff that have provided care within 2 metres to a possible or confirmed case of COVID-19 for more than 15 minutes.
- **Outbreak:** Two or more cases which meet the case definition of possible or confirmed case as above, within a 14-day period among either residents or staff in the care home.

## 1. Admission of residents

The care sector looks after many of the most vulnerable people in our society. In this pandemic, we appreciate that care home providers are first and foremost looking after the people in their care, and doing so while some of their staff are absent due to sickness or isolation requirements. As part of the national effort, the care sector also plays a vital role in accepting patients as they are discharged from hospital – both because recuperation is better in non-acute settings, and because hospitals need to have enough beds to treat acutely sick patients. Residents may also be admitted to a care home from a home setting. Some of these patients may have COVID-19, whether symptomatic or asymptomatic. **All of these patients can be safely cared for in a care home if this guidance is followed.**

If an individual has no COVID-19 symptoms or has tested positive for COVID-19 but is no longer showing symptoms and has completed their isolation period, then care should be provided as normal.

## Annex D: Receiving residents being discharged from hospital

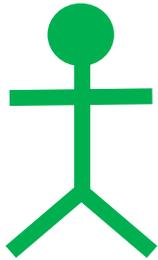
Hospitals around the country need as many beds as possible to support and treat an increasing number of COVID-19 cases. This means the NHS will seek to discharge more patients into care homes for the recovery period (see Table 1).

During the COVID-19 response it will not be possible for care homes to visit a potential resident in hospital to assess their care needs. A Discharge to Assess (D2A) model is in place to streamline the discharge process and the assessment of care needs will be undertaken by hospital discharge teams, in collaboration with Trusted Assessors.

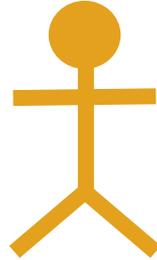
Table 1: Care needs of residents being discharged from hospital (see plain text below)

Upon discharge, patient/resident has...	What care is required upon discharge?	What care is required upon first sign of symptoms?
No symptoms of COVID-19	Provide care as normal	Provide care in isolation if symptoms occur within 14 days of discharge from hospital <ul style="list-style-type: none"> <li>• Resident does not leave room (including for meals) for 14 days after onset of symptoms or positive test</li> <li>• Staff wear protective equipment &amp; place in clinical waste after use</li> </ul> Consult resident's GP to consider if re-hospitalisation is required
Tested positive for COVID-19 <ul style="list-style-type: none"> <li>✓ No longer showing symptoms</li> <li>✓ Completed isolation period</li> </ul>	Provide care as normal	N/A
Tested positive for COVID-19 <ul style="list-style-type: none"> <li>✓ No longer showing symptoms</li> <li>⚠ Not yet completed isolation</li> </ul>	Provide care in isolation <ul style="list-style-type: none"> <li>• Resident does not leave room (including for meals) for 14 days after onset of symptoms or positive test</li> <li>• Staff wear protective equipment &amp; place in clinical waste after use</li> </ul>	N/A

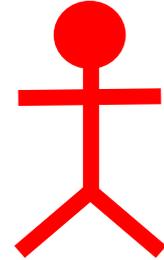
# Current guidance – PH England



Asymptomatic  
resident  
(no symptoms)

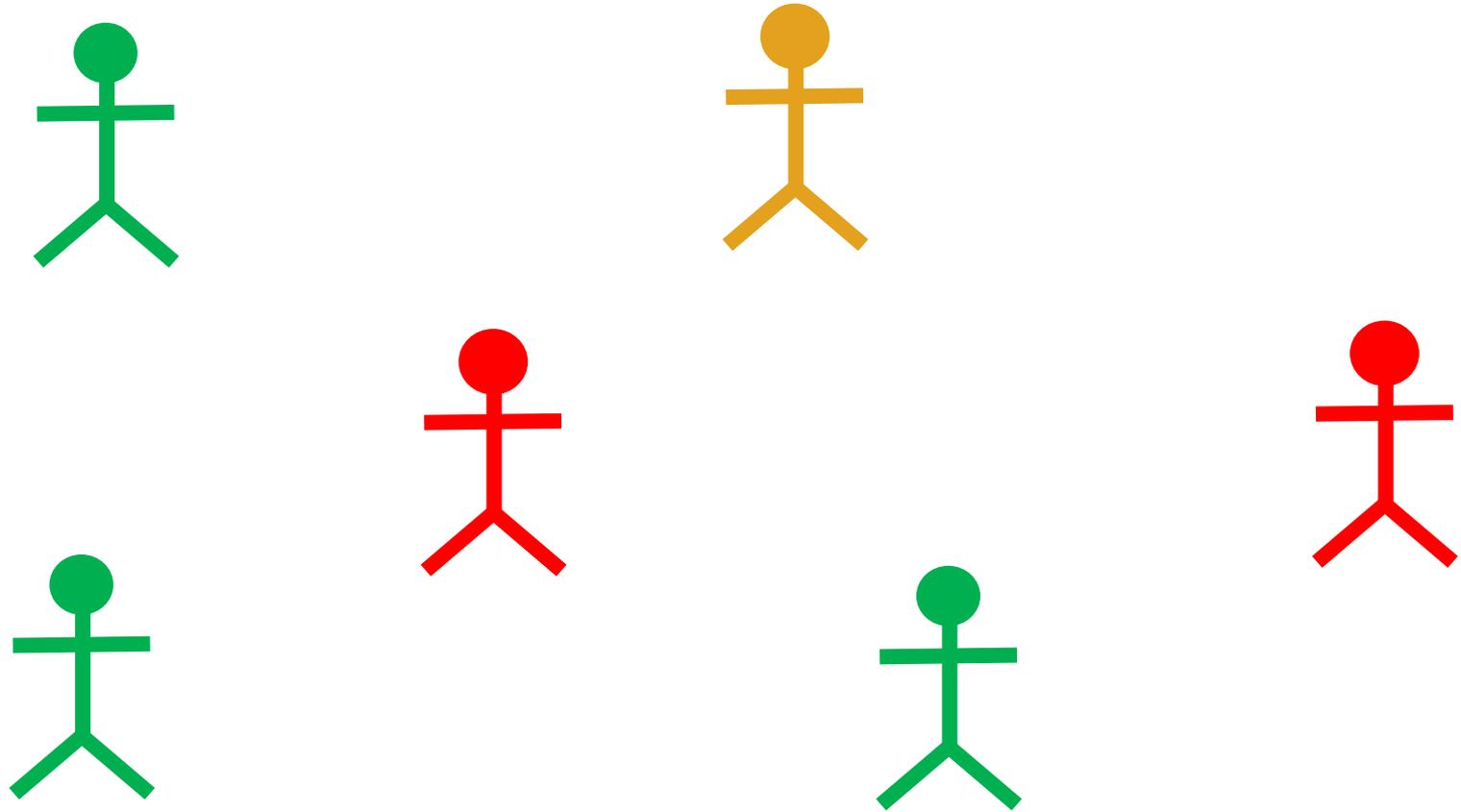


Resident  
discharged from  
hospital within the  
last 14 days

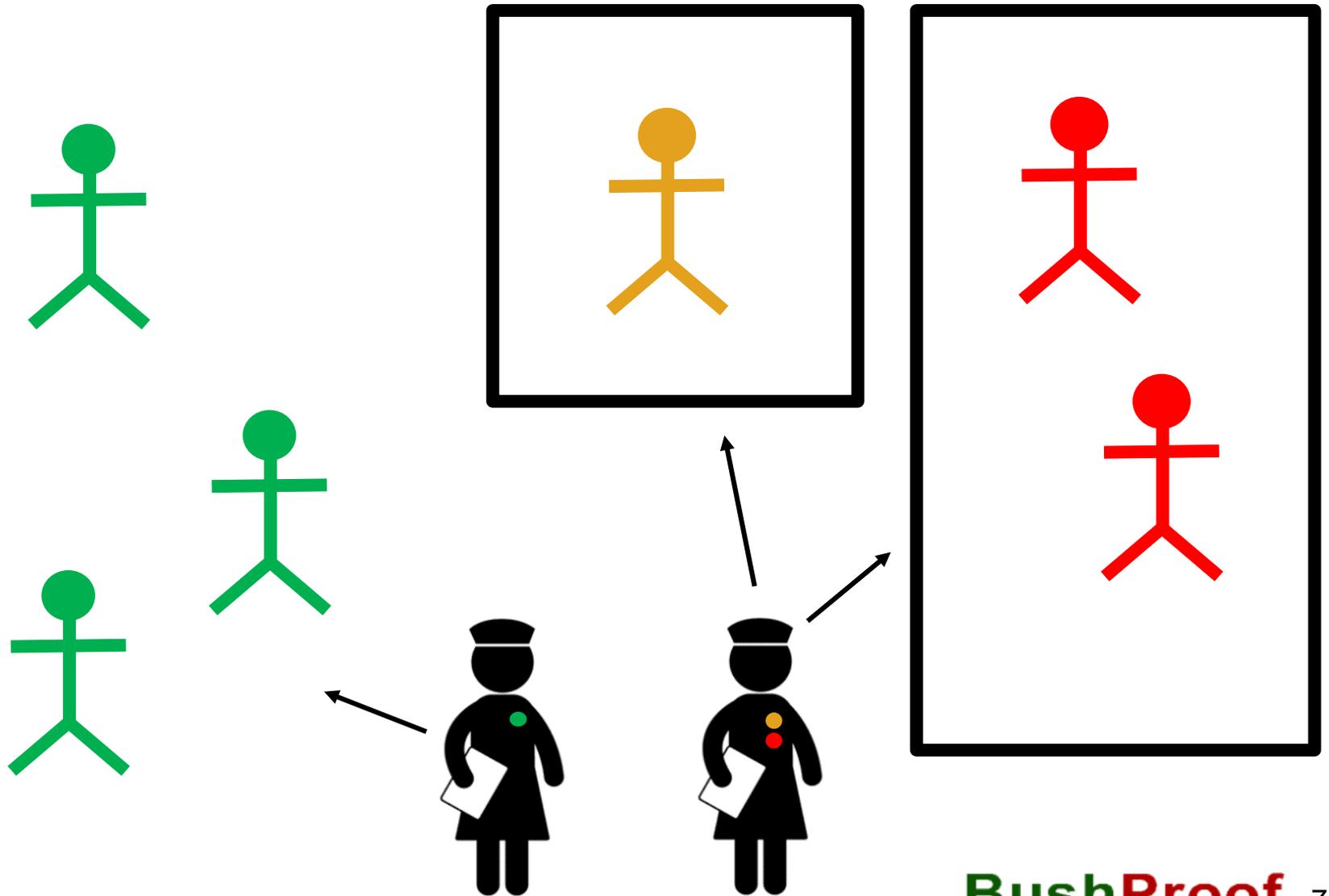


Symptomatic  
resident

# Current guidance – PH England



# Current guidance – PH England

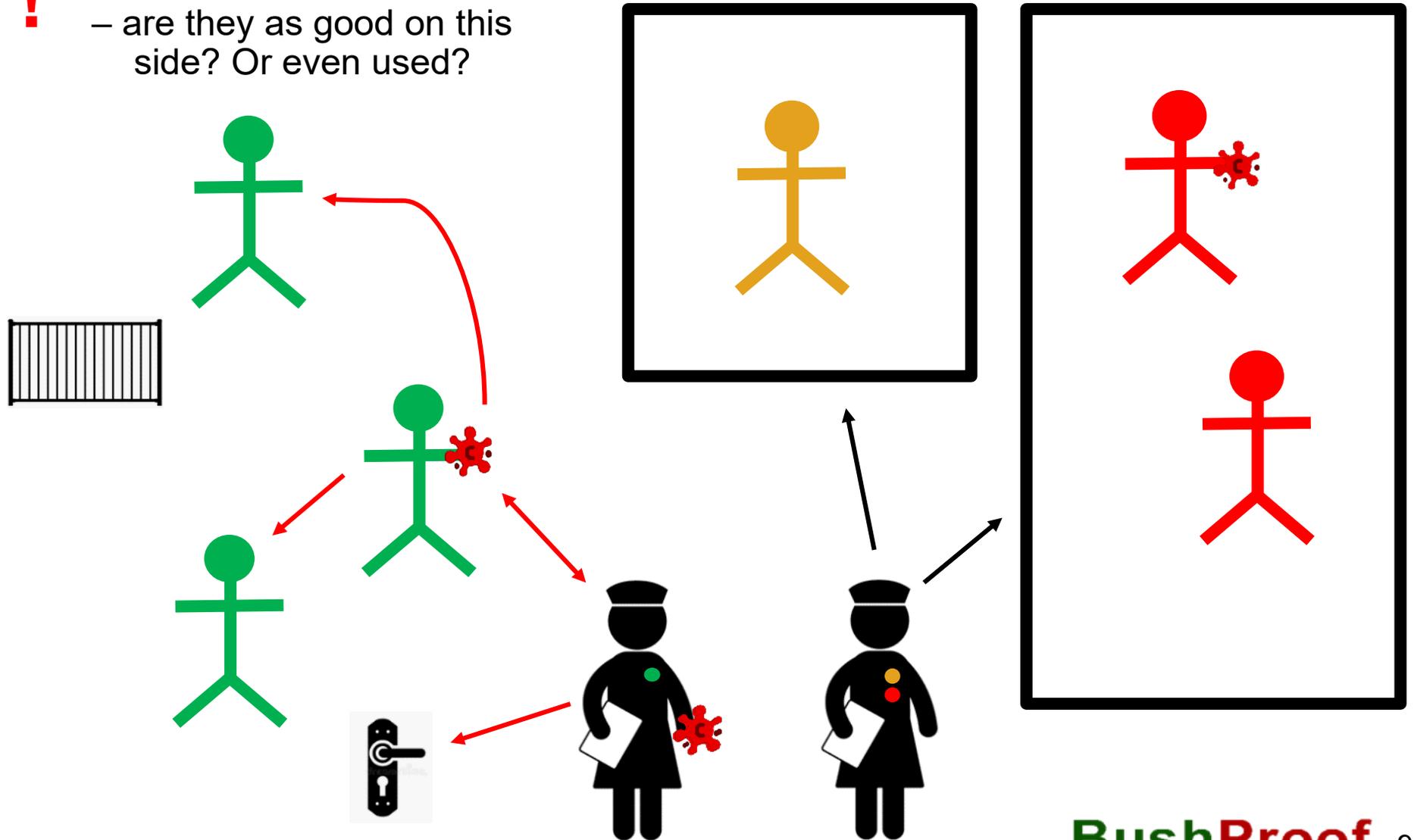


# The problem with that: asymptomatic transmission

- The problem with current PHE guidance for infection control = does not account asymptomatic / pre-symptomatic transmission
- Why is this a problem? If a resident or staff member has no symptoms they can still:
  - a. Have COVID-19
  - b. Be infectious to others
- Many asymptomatic carriers are in fact probably just pre-symptomatic
- Care homes are filled with vulnerable people
- If you don't have adequate infection control that takes into account transmission risk from a/pre-symptomatic people, then you risk infecting those vulnerable people

# Asymptomatic transmission

! Infection control & barriers  
– are they as good on this  
side? Or even used?



# Asymptomatic transmission – evidence

- Kimball, A. *et al* (2020)
  - Tested 76 out of 82 (93%) residents
  - Positive test: 23 residents (30%). Of these positive cases:
    - 10 out of 23 (43%) had symptoms on the date of the test.
    - The remaining 13 out of 23 (57%) were asymptomatic. 7 days after testing, 10 out of 13 of the asymptomatic residents had developed symptoms.
  - Conclusion: symptom-based screening in long-term care facilities could fail to identify approximately half of residents with COVID-19
- Gandhi, M.P.H. *et al* (2020)
  - People that don't have symptoms can carry the virus and be infective – e.g. 17 of 24 specimens (71%) from pre-symptomatic persons had viable virus by culture 1 to 6 days before the development of symptoms
  - Conclusion: current (symptom-based) approaches are inadequate

# Asymptomatic transmission – evidence

Research	Main lessons to take away
<p>Wei, W.E. et al (2020) Presymptomatic Transmission of SARS-CoV-2 – Singapore, January 23 – March 16, 2020. <i>Morbidity and Mortality Weekly Report</i>, CDC. April 10, 2020, Vol. 69, No. 14. <a href="https://www.cdc.gov/mmwr/volumes/69/wr/pdfs/mm6914e1-H.pdf">https://www.cdc.gov/mmwr/volumes/69/wr/pdfs/mm6914e1-H.pdf</a></p>	<p>Evidence of pre-symptomatic transmission in Singapore supports the likelihood that viral shedding can occur in the absence of symptoms and before symptom onset.</p>
<p>Kimball et al (2020) Asymptomatic and Presymptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility – King County, Washington, March 2020. <i>Morbidity and Mortality Weekly Report</i>, CDC. April 3, 2020, Vol. 69, No. 13. <a href="https://www.cdc.gov/mmwr/volumes/69/wr/pdfs/mm6913e1-H.pdf">https://www.cdc.gov/mmwr/volumes/69/wr/pdfs/mm6913e1-H.pdf</a></p>	<p>Suggests that symptom-based screening in long-term care facilities could fail to identify approximately half of residents with COVID-19.</p>
<p>Arons, M.M. et al (2020) Presymptomatic SARS-CoV-2 Infections and Transmission in a Skilled Nursing Facility. <i>The New England Journal of Medicine</i>. April 24, 2020. <a href="https://www.nejm.org/doi/pdf/10.1056/NEJMoa2008457?articleTools=true">https://www.nejm.org/doi/pdf/10.1056/NEJMoa2008457?articleTools=true</a></p>	<p>Infection control strategies solely focusing on symptomatic residents were not enough to prevent introduction of the virus into the facility.</p>
<p>Gandhi, M.P.H. et al (2020) Asymptomatic transmission, the Achilles' Heel of Current Strategies to Control Covid-19. <i>The New England Journal of Medicine</i>. April 24, 2020. <a href="https://www.nejm.org/doi/pdf/10.1056/NEJMe2009758?articleTools=true">https://www.nejm.org/doi/pdf/10.1056/NEJMe2009758?articleTools=true</a></p>	<p>Viral loads with SARS-CoV-1 (virus from 2003) were associated with symptom onset, peak a median of 5 days later than viral loads with SARS-CoV-2 (virus from 2020). With the current virus (SARS-CoV-2), people that don't have symptoms can carry the virus and be infective – e.g. 17 of 24 specimens (71%) from pre-symptomatic persons had viable virus by culture 1 to 6 days before the development of symptoms.</p>
<p>Baggett, T. P et al (2020) Prevalence of SARS-CoV-2 Infection in Residents of a Large Homeless Shelter in Boston, <i>JAMA</i>. Published online April 27, 2020. 27 April 2020. <a href="https://jamanetwork.com/journals/jama/fullarticle/2765378">https://jamanetwork.com/journals/jama/fullarticle/2765378</a></p>	<p>A total of 147 participants (36.0%) had PCR test results positive for SARS-CoV-2. Among individuals with PCR test results positive for SARS-CoV-2, 87.8% were asymptomatic. Results support PCR testing of all asymptomatic shelter residents if a symptomatic individual with COVID-19 is identified in the same shelter.</p>

# Asymptomatic transmission – evidence

Research	Main lessons to take away
<p>Public Health England – April 2020. Report not seen but referenced in the following two articles: <a href="https://www.bbc.co.uk/news/uk-52727221">https://www.bbc.co.uk/news/uk-52727221</a> (date: 19 May 2020) and <a href="https://www.theguardian.com/world/2020/may/18/agency-staff-were-spreading-covid-19-between-care-homes-phe-found-in-april">https://www.theguardian.com/world/2020/may/18/agency-staff-were-spreading-covid-19-between-care-homes-phe-found-in-april</a> (date: 18 May 2020).</p>	<p><u>BBC</u>: Study carried out over the Easter weekend. PHE said the results suggested there were "high numbers of asymptomatic or pre-symptomatic cases among staff and residents" and that "infection may be being imported into the homes by staff".</p> <p><u>Guardian</u>: Genome tracking research by PHE into the behaviour of the virus in six care homes in London found that "Infection is spreading from care home to care home, linked to changed patterns of staffing, working across and moving between homes."</p>
<p>Zhanwei Du, Xiaoke Xu, Ye Wu, Lin Wang, Benjamin J. Cowling, and Lauren Ancel (2020) Serial Interval of COVID-19 among Publicly Reported Confirmed Cases, <i>Research Letter</i>. Volume 26, Number 6—June 2020. <a href="https://wwwnc.cdc.gov/eid/article/26/6/20-0357_article">https://wwwnc.cdc.gov/eid/article/26/6/20-0357_article</a></p>	<p>12.6% of case reports indicated presymptomatic transmission.</p>
<p>Pauline Vetter, Diem Lan Vu, Arnaud G L’Huillier, Manuel Schibler, Laurent Kaiser, Frederique Jacquerioz (2020) Clinical features of covid-19: The wide array of symptoms has implications for the testing strategy, Editorial, <i>BMJ</i>. (Published 17 April 2020). <a href="https://www.bmj.com/content/bmj/369/bmj.m1470.full.pdf">https://www.bmj.com/content/bmj/369/bmj.m1470.full.pdf</a></p>	<p>Up to 12% of transmission occurs before an index case develops symptoms. This has important implications for the effectiveness of any testing strategy and for contact tracing and containment measures.</p>

# Current guidance – PH Scotland

New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) is the UK expert committee charged with reviewing scientific evidence on COVID-19 in order to inform UK Government policy. It considered the current limited published evidence on asymptomatic carriage of the COVID-19 virus at a meeting in late April 2020 but declined to provide definitive recommendations on how asymptomatic test positive cases should be managed.

There is a lack of good quality scientific evidence on which to base firm recommendations on the management of individuals who are asymptomatic for COVID-19 infection but who nonetheless are found to be PCR test positive. This guidance has therefore been developed using a consensus based model and is being published as 'interim' guidance, to be updated in light of new evidence and lessons learned by care professionals and local HPTs from practical experience. It is published as a standalone document meantime but will be incorporated as an annex to the main HPS Care Homes guidance document in due course.

# Current guidance – PH Scotland

Symptoms in the elderly are often vague or atypical of the presentation of COVID-19 infection. Staff may also not report classical COVID-19 symptoms initially but on closer questioning often report milder and / or atypical symptoms. In these studies, some residents who had reported having symptoms were nonetheless test result negative. Therefore, being symptomatic was neither sensitive nor specific for proven COVID-19 infection in terms of residents or staff being test positive. This indicates that high proportions of staff and residents in an affected care home are likely to test positive, even those that are reportedly asymptomatic.

Evidence is also accumulating that people who are asymptomatic (in terms of the standard COVID-19 case definition) and PCR test positive, may in fact be 'pre-symptomatic' with a potentially high proportion of such people going on to be clinically symptomatic within 7-8 days. The importance of this is that these asymptomatic people may in fact be shedding virus in significant quantities and therefore may pose a potential risk of transmitting virus to others, especially the vulnerable elderly in a care setting.

Epidemiological studies are being undertaken to help better understand COVID-19 transmission risk across various countries and settings. Preliminary results from testing carried out in care homes in Scotland and England, where infection with COVID-19 has been reported, has found up to half, and sometimes more, of both residents and staff to be COVID-19 PCR test positive. Therefore, at the point at which an outbreak is first suspected (based on the conventional definition of an outbreak as two linked cases), a high proportion of staff and residents may well already be PCR positive. Current evidence suggests that even if tested early during an outbreak (e.g. on clinical suspicion of a first case), approximately 25% of care home staff could be found to be positive. Therefore, a high index of suspicion with respect to possible COVID-19 infection in a care home is essential to identify an outbreak and intervene early.

It is also therefore essential that all care homes must have carried out advance planning to anticipate an outbreak, liaising with local health and social care partners to consider the impact of managing an outbreak. This must include anticipating the impacts of adopting a universal staff and resident testing policy which could result in significant loss of care staff. It is therefore essential that a risk assessment is undertaken in each care home, before mass testing is carried out, and plans are made to replace staff at short notice.



# Solutions

- Testing will help us, but won't help solve the transmission problem until they can be done very often + with rapid results + with high reliability
- Until then, the lag between test and results (2 days +) or between tests per staff member (1 week +) means where staff come and go every day, they could easily be asymptomatic and bringing COVID back in from outside in the interim
- Therefore we must rely on secondary barriers to control transmission, where we treat every person (resident or staff) as a suspected case (i.e. with ability to transmit COVID-19)
- And therefore why we are promoting strict infection control, the most key elements being:
  1. Clear delineation of risk zones for the whole building
  2. Hand disinfection for all points between risk zones (even where gloves remain on)

# Solutions

This is what has informed our strategy:

Care Homes Strategy for Infection Prevention & Control of  
Covid-19 Based on Clear Delineation of Risk Zones

Available here:

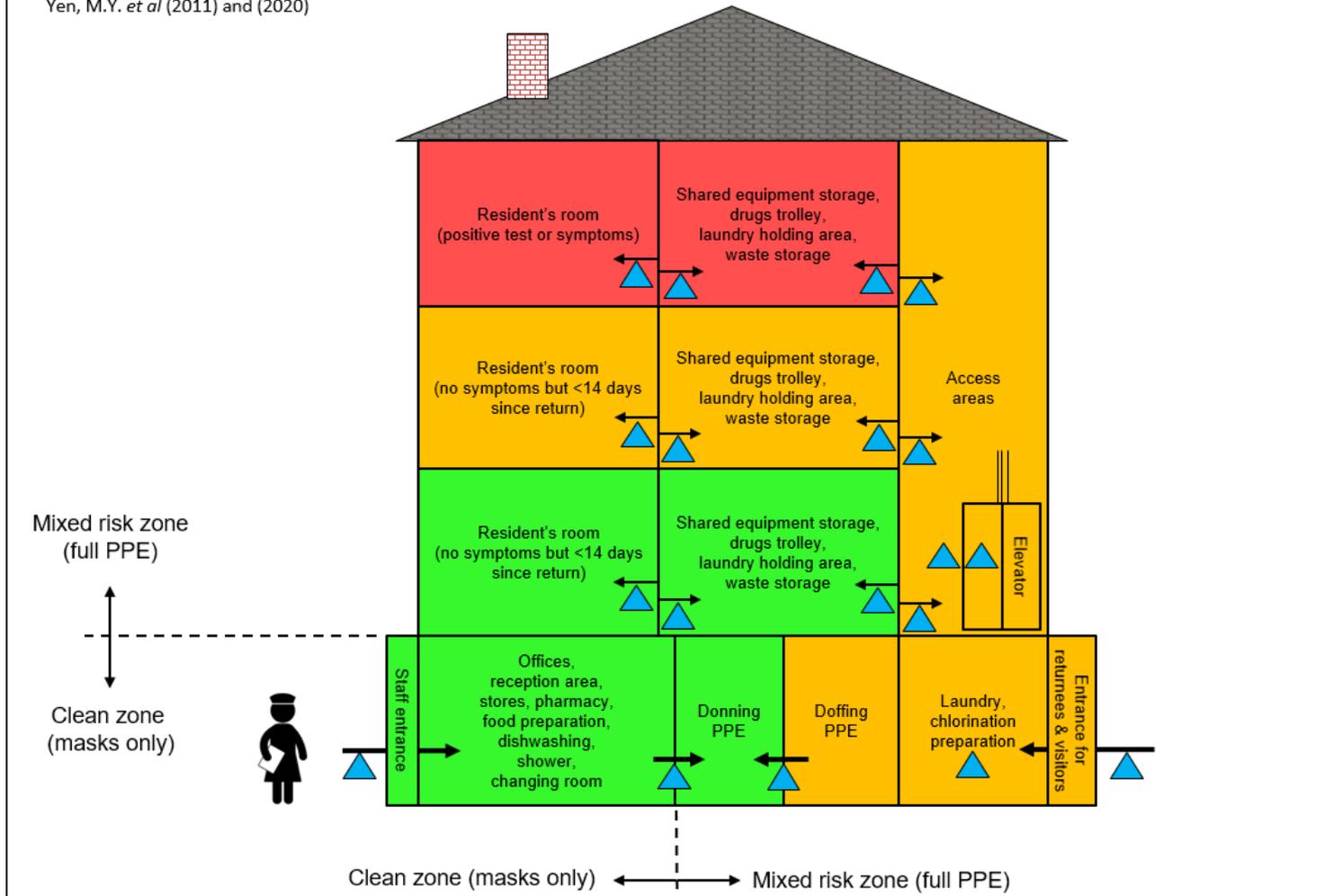
<https://www.bushproof.com/care-homes-strategy-for-infection-prevention-control-of-covid-19-based-on-clear-delineation-of-risk-zones/>

# Clear delineation of zones

## 1. Delineation of risk zones – different floors, same building (section)

▲ Hand hygiene

Adapted from traffic control bundling concept in:  
Yen, M.Y. *et al* (2011) and (2020)

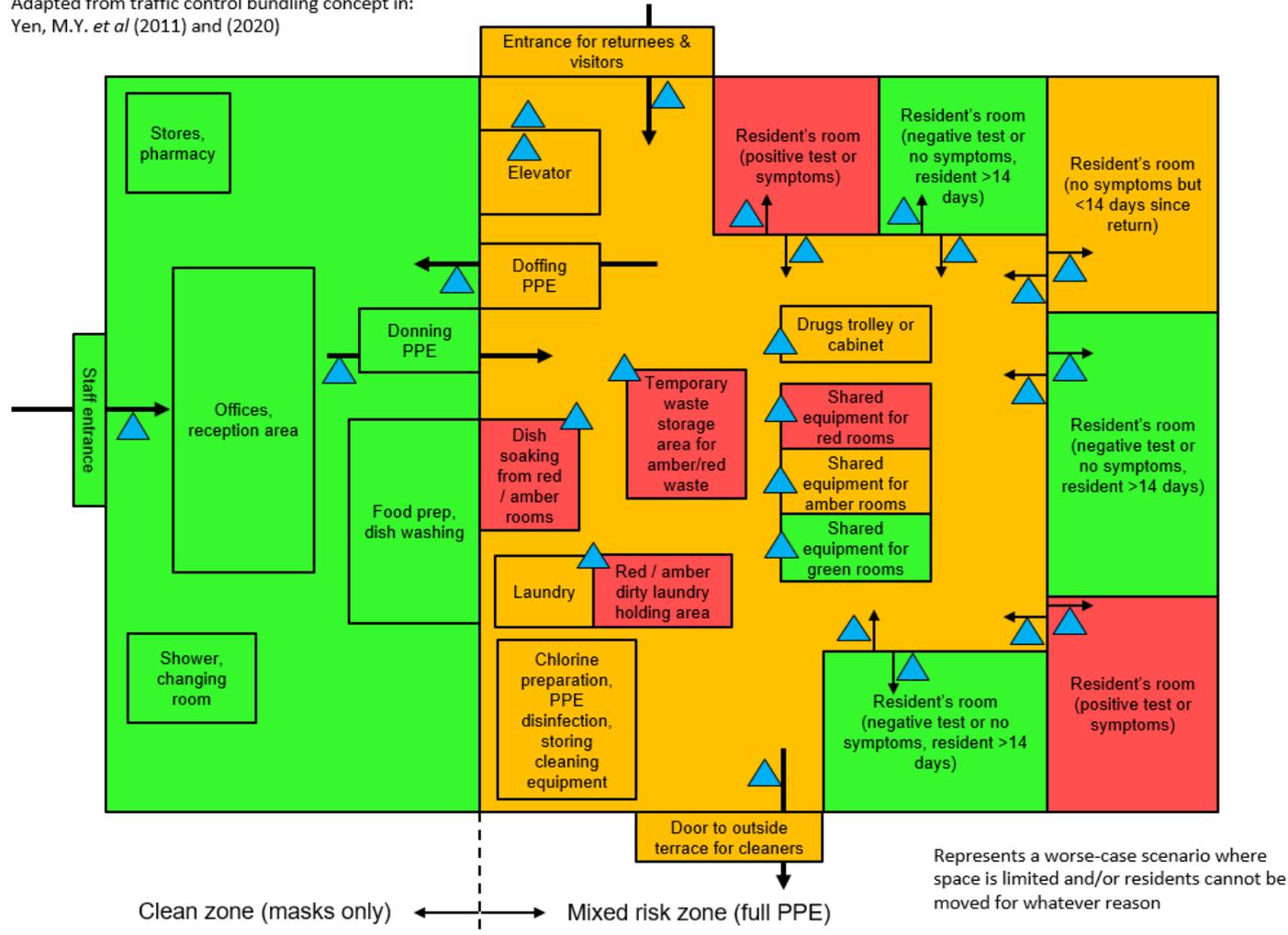


# Clear delineation of zones

## 2. Delineation of risk zones – same floor, same building (plan)

▲ Hand hygiene

Adapted from traffic control bundling concept in:  
Yen, M.Y. *et al* (2011) and (2020)



# Clear delineation of zones

	Green zone		Amber zone	Red zone
Activity	Anything on the side before putting on full PPE – e.g.	Residents' rooms (no symptoms, resident in situ more than 14 days)	Residents' rooms (no symptoms but returned from hospital within last 14 days)	Residents' rooms (for people who have symptoms)
	Stores		Access areas / elevators	Disinfection / storage area for shared equipment (e.g. thermometers, BP machine, hoists, commodes – see section 5 below)
	Pharmacy		Entrance for essential visitors / returning residents	
	Offices		Chlorine / cleaning preparation / PPE disinfection / drying area (door to terrace, lines outside?)	Temporary waste disposal area for waste from amber / red rooms
	Shower		Nursing station / drugs cupboard or trolley	Dish soaking from red rooms
	Changing room		Laundry	Dirty laundry holding area from red rooms
	Food preparation		Toilets for staff	
	Staff eating area			
	Dish washing			
PPE	Mask only	Full PPE	Full PPE (since it is a quarantine zone = asymptomatic hospital returnees)	Full PPE

Guidance for deciding which resident is in which category

Symptoms checked in order to keep tabs on residents, but we don't use that as criteria for higher or lower level of hygiene / IPC (even for 'green' asymptomatic residents)

# Hand hygiene

Disinfect



Touch



Disinfect



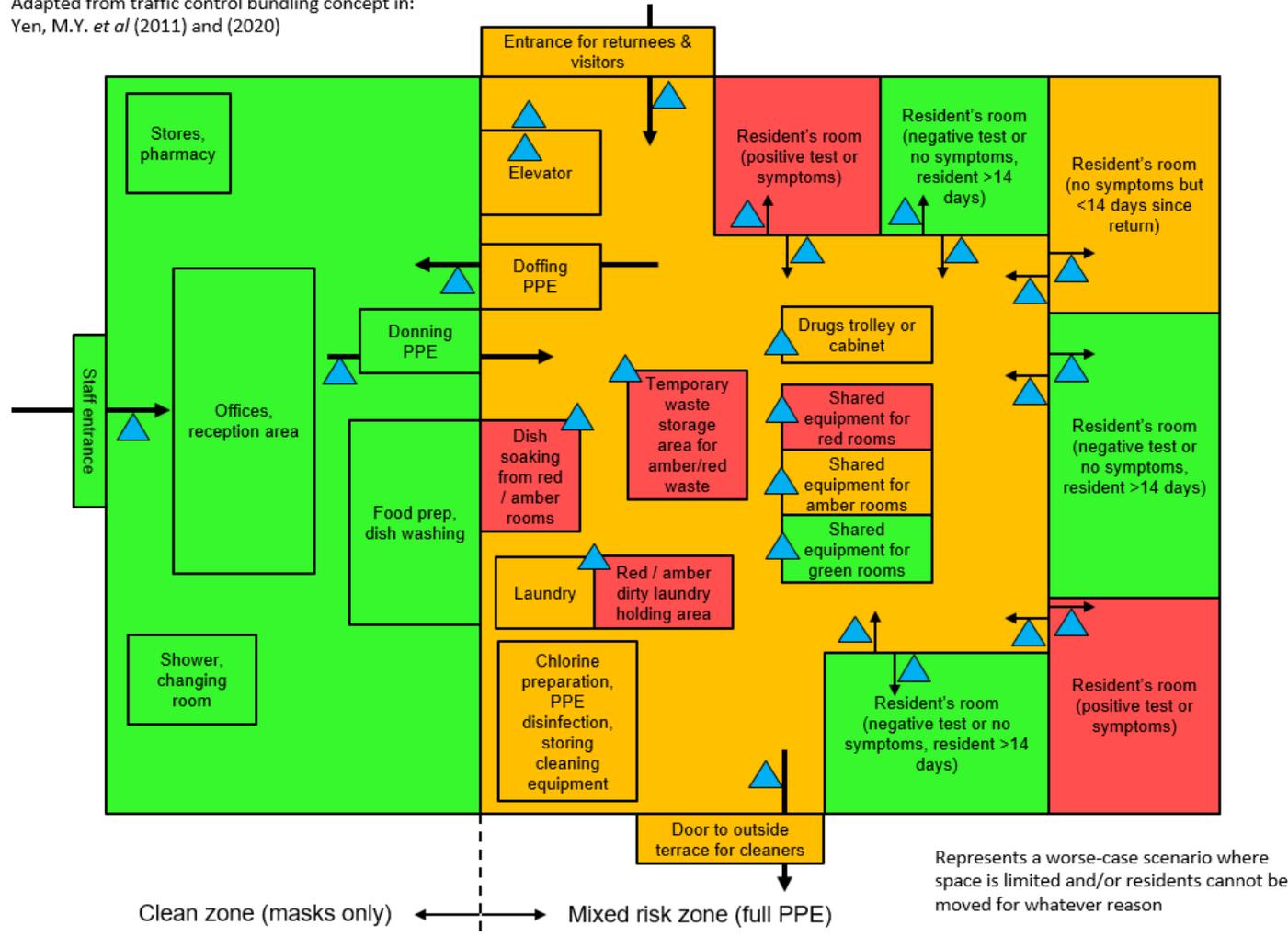
- Need alcohol rub at all key points (e.g. both sides of the each door)
- Based on experience from the SARS outbreak, we also recommend performing hand disinfection even when gloves are on, in order to reduce transmission of the virus from / to different surfaces in the environment

# Hand hygiene

## 2. Delineation of risk zones – same floor, same building (plan)

▲ Hand hygiene

Adapted from traffic control bundling concept in:  
Yen, M.Y. *et al* (2011) and (2020)



## Signage

# Wash your hands!



# Staff allocation & rotation

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- There are also other parts of the strategy
- But all based on a whole building approach, and on a/pre-symptomatic transmission risk

# Thanks for listening!

Link to where you can download the strategy document:

<https://www.bushproof.com/care-homes-strategy-for-infection-prevention-control-of-covid-19-based-on-clear-delineation-of-risk-zones/>

For any questions, comments or suggested changes, please contact:

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