

Developing better understanding of hygiene is key to developing hygiene behaviour change in home and everyday life settings

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Abstract

Aims: Polling indicates the public has fairly good knowledge of times when hygiene is needed in their homes and everyday life in public spaces, but limited understanding of hygiene risk; this results in omitting some key behaviours and incorrectly applying untargeted behaviours. This poll explores how the public responded to government advice, and information from other sources, to address a specific disease threat – that is, COVID-19 infection.

Methods: An online poll was developed, and data were collected from 1730 respondents in England aged 18 and above.

Results: Data suggest that the UK public has a high level of concern about the importance of hygiene to prevent spread of COVID-19. They had good recall of advice given during the pandemic and were able to identify routes of infection transmission. When asked to identify key times for handwashing, most people (86%–90%) identified ‘after coughing, sneezing etc., before eating food with fingers, after touching contact surfaces and when returning home’, but a similar number also identified using the toilet, food handling and pet handling, despite the fact that government advice does not identify these as risk actions for COVID-19. This suggests they were unable to use their knowledge of how the virus spreads to make informed decisions about when to practice hygiene. Despite government guidance, public practices are still influenced by a conviction that deep cleaning, including non-targeted disinfectant usage on environmental surfaces, gives added protection, leading them to practise additional cleaning and disinfection in situations where there is little benefit.

Conclusions: New insights from public polling, together with the nine moments Targeted Hygiene approach, offer a more robust communications approach to enable the public to make cognitive links between when, where, how and why to practise good hygiene, and in doing so, promote more effective and sustainable behaviours.

INTRODUCTION

Since 1997, the International Scientific Forum on Home Hygiene (IFH) has been developing an approach to hygiene in our homes and everyday life in public spaces, based on the principles of risk management. This approach, known as Targeted Hygiene, focuses hygiene practices at the times when harmful microbes are most likely to spread, in order to break the chain of infection.^{1–3} Progressively, risk management is being accepted as a more practical approach for

developing public health measures such as hygiene, which require a multibarrier approach.^{3,4} Getting the public to adopt Targeted Hygiene, however, requires an understanding of risk.

In the last 4 years, the IFH in collaboration with the Royal Society for Public Health (RSPH) and the International Association for Soaps, Detergents and Maintenance products (AISE) have carried out polls in UK (2018, 2000 people)^{5,6} and Europe (23 countries in 5 regions, 4500 people)⁷ to investigate cognitive

Table 1

Public perceptions about routes of transmission of COVID-19 infection.

To what extent do you agree or disagree with the following statements about how you can become infected with COVID-19?	Net agree		
	Total	Male	Female
If I touch surfaces that are touched by others	80%	77%	83%
If someone coughs or sneezes near me	87%	85%	89%
If I touch inside my nose with virus-contaminated hands	82%	81%	82%
If I touch inside my mouth with virus-contaminated hands	85%	84%	86%
If I touch my eyes with virus-contaminated hands	75%	46	52%
If I touch food with virus-contaminated fingers and then eat it	70%	67%	71%
COVID-19 virus on my skin can get through the layers of my skin and infect me	31%	32%	30%
I do not know how I get infected with the COVID-19 virus	10%	12%	9%

understanding of hygiene and hygiene risk. It was found that although the public's actions are to some extent guided by their perception of risk, they have limited understanding of what Targeted Hygiene means in practice, resulting in untargeted behaviours with little health benefit. A fundamental concern is public confusion about what hygiene is and how it differs from cleanliness. The 2020 European Union (EU) poll showed that whereas 58%–68% of respondents across the five regions agreed hygiene is more than cleaning, it is about protection of health, a significant number (15%–20%) believed hygiene and cleaning are the same thing, while some (16%–28%) believe hygiene means using a disinfectant and cleaning means using detergent or soap.

This article describes polling carried out in England in April 2022, which used the pandemic as an opportunity to explore how the public responded to government advice, and information from other sources, to address a specific disease threat.

METHODS

RSPH developed a survey to assess how public perceptions of hygiene, hygiene risk and hygiene behaviours have been

shaped or reshaped by the COVID-19 pandemic. Data were collected between 12 and 14 April 2022 by Yonder,⁸ using an online poll with an in-house panel of 1730 respondents in England, aged 18 and over, weighted to be representative of the population. Respondents recorded their answer as, for example, strongly agree, slightly agree (net agree), strongly disagree, and slightly disagree (net disagree). Data relating to age, gender, social grade, income, geographic region and employment sector were captured.

RESULTS

Public perception about routes of transmission of COVID-19 infection

When questioned about how they thought they could be infected by COVID-19 virus, although 10% of respondents said they did not know, the data suggest that in line with government messaging, they had a relatively good level of knowledge (Table 1) of probable routes of transmission. Overall, 70%–87% said that COVID-19 can be spread via the air (coughing, sneezing, talking, shouting, etc.) or by touching surfaces frequently touched by others, or by eating food with contaminated fingers. This may derive from sayings like 'coughs and sneezes spread diseases', UK Government's 'catch it, bin it, kill it'

campaigns,⁹ and animated graphics publicized during the early phase of the pandemic. Interestingly, 75% of respondents understood that as well as touching their nose or mouth with contaminated fingers, they could also be infected by touching their eyes. Why 31% thought they could be infected by a virus penetrating the skin of their hands is difficult to explain.

Public understanding about when to wash their hands

Table 2 shows that in line with government advice, when given a set of choices on important times to wash hands to prevent spread of COVID-19, 86%–90% correctly identified 'after coughing, sneezing and nose blowing, before eating food with fingers, after touching surfaces frequently touched by others, and when returning home'.

However, a similar number (84%–90%) also mistakenly identified washing hands after using the toilet and handling raw food as important for preventing spread of COVID-19, and 56% thought handwashing after handling their pets was important. Although hand hygiene after handling raw food and using the toilet are risk moments for spread of gastrointestinal infection, they are not identified as risk factors for spread of

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Table 2

Public understanding about when to wash their hands to prevent spread of COVID-19 and other infections.

To what extent do you agree or disagree that the below are important moments to wash/sanitize your hands?	Net agree		Male	female
	Total			
	To prevent spread of COVID-19 infection	To prevent spread of any infection	Combined COVID/any infection	
They should be washed/sanitized frequently	85%	84%	81%	88%
I don't know what are the most important moments to wash my hands	10%	10%	13%	8%
After handling raw meat and poultry	84%	88%	80%	87%
After using the toilet	90%	89%	86%	92%
After coughing or sneezing into my hands	90%	84%	87%	92%
After touching surfaces frequently touched by other people	86%	85%	82%	89%
Before eating food with my fingers	89%	85%	85%	91%
When arriving home from work, school, shopping, etc.	86%	84%	82%	88%
After touching my pets	56%	59%	53%	61%
After cleaning my home	73%	74%	72%	75%

COVID-19. Respondents were asked the same set of questions about preventing spread of all types of infections. For each moment, the percentage expressing concern about the need for handwashing was almost identical regardless of whether the questions were about spread of infections in general or specifically about COVID-19.

Public understanding of handwashing and other behaviours to prevent spread of COVID-19

When asked to identify measures, in addition to handwashing, which they believed important for preventing spread of COVID-19 (Table 3), in line with government messaging, 81%–90% correctly identified social distancing, good ventilation, mask wearing, and cleaning and disinfection of hand contact surfaces.

However, a significant proportion of people (59%) also believed that wearing gloves could protect against infection,

failing to recognize that both gloved and ungloved hands, if contaminated, can transmit infection to the eyes, nose and mouth. A further concern is that 80% and 72%, respectively, agreed that regular deep cleaning of their home and using a disinfectant for routine home cleaning are important for preventing spread of COVID-19 infections between family members.

Further questioning about how to prevent spread of COVID-19 among family members (Table 4) shows the public were very aware of the need for enhanced hygiene measures when a family member became infected. They also recognized that no single action was 100% effective, and that the various behaviours work together to maximize protection. However, as in Table 3, 49% said that, since the onset of the pandemic, as a measure to prevent spread of infection, they had started to use an antibacterial cleaner when cleaning their home, and 57% said that homes should be 'deep cleaned'

after someone in their home had been infected.

Public awareness of the importance of hygiene in their homes and everyday lives

When respondents were questioned about the importance of hygiene (Table 5), more than 70% agreed that COVID-19 had shown them why practising good hygiene is important, both in their home and in shared public spaces, and intended to continue to practise good hygiene. This compares with the 2018 UK poll^{5,6} which indicated that hygiene awareness was already high, with 98% acknowledging the importance of hygiene in the home. The 2018 poll showed that people were also aware of current issues that make hygiene important. Half of those surveyed (50%) agreed that poor hygiene contributes to antimicrobial resistance (AMR), and almost three (74%) in four people believed hygiene is important because it

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Table 3

Public understanding of the importance of different measures for preventing spread of COVID-19 infection.

How effective do you believe the following measures are for preventing the spread of COVID-19?	Net effective		
	Total	Male	Female
Social distancing	88%	86%	90%
Avoiding crowded places	90%	87%	92%
Good ventilation/opening windows	90%	87%	92%
Frequent handwashing/sanitizing	89%	87%	92%
Regular cleaning and disinfection of hand contact surfaces	85%	81%	88%
Mask wearing	81%	79%	82%
Regular deep cleaning of my home	72%	69%	75%
Using a disinfectant for routine cleaning of my home	80%	77%	84%
Wearing gloves	59%	60%	58%

Table 4

Public understanding of general behaviours to prevent spread of COVID-19 infection.

To what extent do you agree or disagree with the following statements about how to prevent the spread of COVID-19?	Net agree		
	Total	Male	Female
If I have COVID-19, I need to take extra hygiene measures and keep away from others in the household wherever possible to help prevent them from getting infected	83%	80%	86%
None of the government recommended measures we can take are 100% effective, so it's important to follow as many of the recommended measures as possible	83%	80%	85%
If someone in my home has COVID-19, the house needs to be deep cleaned to get rid of the virus	57%	54%	61%
Since the COVID-19 pandemic, I have started to use an antibacterial cleaner when cleaning my home	49%	49%	49%

Table 5

Public opinions on the importance of good hygiene.

To what extent do you agree or disagree with the following statements about how the COVID-19 pandemic has impacted your understanding and motivation to practise good hygiene?		Net agree		
		Total	Male	Female
COVID has shown me why practising good hygiene in my own home is important to protect against infectious diseases.	At home	79%	77%	81%
	In public places	83%	79%	87%
I have made a big effort during the pandemic to follow government advice and practise good/better hygiene	At home	83%	80%	85%
	In public places	84%	82%	86%
I intend to/will continue to make greater effort to practise good hygiene in my home	At home	77%	75%	80%
	In public places	82%	76%	85%

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Table 6

Attitudes to hygiene ongoing – are the public suffering from hygiene fatigue?.

To what extent do you agree or disagree with the following statements about hygiene and hygiene practices during the COVID-19 pandemic?	Net agree		
	Total	Male	Female
I hear, see, and read too much about good hygiene and good hygiene practices	24%	27%	21%
I am fed up with being asked to practise hygiene all the time, I think it's a waste of time	15%	19%	11%
The COVID-19 pandemic has made me more confused than I was before about when, why, and how to practise good hygiene to prevent the spread of infectious diseases, including COVID-19	15%	17%	12%
I believe getting people to change behaviour to prevent spread of infectious diseases is as important as changing behaviours to prevent climate change	70%	66%	74%

Table 7

Impact of age on hygiene understanding.

	Age group	18–24	25–34	35–44	45–54	55–64	65+
Table 1	Total number responses	1176	1806	1686	1248	1488	2870
	To what extent do you agree with these statements about how you can be infected with COVID-19?	Touching surfaces touched by others, if someone coughs or sneezes near me, if I touch my nose, mouth, eyes or food with virus-contaminated hands					
	% of respondents net agree	71%	76%	79%	80%	87%	82%
Table 2	Total number responses	588	903	843	924	744	1185
	To what extent do you agree that these are important moments to wash/sanitize your hands?	After coughing or sneezing into my hands, after touching surfaces frequently touched by other people, when arriving home from work, school, shopping					
	% of respondents net agree	77%	81%	90%	87%	94%	91%
Table 3	Total number responses	980	1505	1405	1540	1240	1975
	How effective do you believe the following measures are for preventing spread of COVID-19	Testing and self-isolating, social distancing, avoiding crowded places, good ventilation, mask wearing					
	% of respondents net effective	82%	83%	86%	84%	94%	93%

reduces pressure on the National Health Service by preventing ill health.

Are we suffering from hygiene fatigue?

Although studies in the US suggest the public are suffering hygiene fatigue,^{10,11} polling suggests this is not the case in the UK. When respondents were asked whether they 'saw, heard and read too much about good hygiene practices' (Table 6), almost twice as many

disagreed than agreed with the statement (40% vs. 24%). When questioned about ongoing attitudes to hygiene, data suggest that more than 75% disagreed that they were being given too much information, although 15% agreed they were tired of being constantly reminded about practicing good hygiene. Surprisingly, 70% said that they hold a similar level of concern about infectious disease threats as about global warming.

Impact of demographic factors on hygiene understanding?

Demographic data indicated differences in social grade, income, geographic region, and employment sector had no observable impact on responses given. Tables 1, 2, 3, 4 and 5 show that females had a higher level of understanding of hygiene and hygiene practice than males, which ranged from 1 up to 7 points. Table 7 shows that the level of understanding of routes of transmission

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of COVID-19 and effective hygiene practice increased with age.

DISCUSSION

The importance of hygiene in our homes and everyday lives

In 2021, in response to the pandemic, the UK Government published its vision for a National Health Resilience Strategy, a 'whole-of-society approach' aimed at making the UK better able to adapt to new challenges. To achieve this, it must include building hygiene resilience.^{12,13} The need for greater hygiene resilience applies not only to addressing threats of future epidemics and pandemics, but also tackling AMR. Equally it includes supporting the ever-increasing population living in the community, who have to take responsibility for increased vulnerability to life-threatening infections.

Overall, this 2022 poll suggests that the English public have a high level of concern about the importance of hygiene to prevent spread of COVID-19 and its importance ongoing into the future, including 70% of respondents holding a similar level of concern about infectious disease threats as about global warming. Although the poll was specific to COVID-19 and the population of England, the questions were similar to those included in the 2018 RSPH UK poll^{5,6} and the 2020 poll across 25 European countries spanning North, South, East and Western Europe (including UK and Ireland).⁷ The data showed that despite cultural differences, levels and nature of understanding of hygiene and hygiene risks were remarkably consistent across European regions, and were consistent with this 2022 poll.

Do the public understand advice and messaging to prevent spread of COVID-19

Data in Tables 1, 2 and 3 indicate the public had good recall of hygiene advice given during the pandemic. Given a range of options, they were able to identify key transmission routes for infection (Table 1). They were also able to identify key moments for handwashing and other actions important to prevent airborne spread as well as contact transmission (Tables 2 and 3). Although (Table 4) most people (75%) were also

aware that 'none of the government recommended measures we can take are 100% effective, so it's important to follow as many of the recommended measures as possible, it failed to convince the public to continue wearing masks voluntarily in crowded places.

Of concern, however, when questioned about hand hygiene, there was a disconnect between knowledge of the routes of spread of infection (Table 1) and the moments for hand hygiene identified as important to prevent spread via these routes (Tables 2 and 3). Thus, when questioned about handwashing to prevent spread of COVID-19 (Table 2), as well as 86%–90% identifying moments related to airborne and contact surface hygiene, a similar number also identified toilet hygiene and food handling as risk moments, and 56% identified 'after handling pets'. In addition, when also asked identical questions about risk moments for handwashing for 'any or all infections' as compared with COVID-19 (also Table 2), they gave very similar answers. Taken together, this suggests that, rather than using their knowledge of COVID-19 transmission routes to make informed decisions on when to practice hygiene, they reverted to memorized general advice.

A further concern is that hygiene behaviours during the pandemic were influenced by lack of understanding of the difference between hygiene and cleanliness. Despite government guidance on where to practise hygiene, data in Tables 3 and 4 show that practices are still influenced by an ongoing conviction that added protection may be gained by 'deep cleaning and disinfection' to eliminate Sars-CoV-2 from living environments, leading to non-targeted hygiene and disinfectant use in situations resulting in little benefit.

These results reinforce findings of the 2018 UK^{5,6} and 2020 European poll,⁷ and a 1989–2017 IFH survey of media coverage,¹⁴ all of which suggest we still largely see hygiene as synonymous with cleanliness aimed at eradicating dirt – inappropriately regarded as the main source of harmful microbes. The European poll⁷ also identified increased usage of disinfectants for cleaning their homes as a result of the pandemic.

Polling in February 2020 compared with repeat polling in June showed increased disinfectant usage compared with February, but this was not correlated with risk:

- For situations considered most risky, for example, cleaning surfaces after handling raw food, cleaning toilet seat, flush handle and lid, and cleaning dishcloths, increased usage was of the order of 2%–3%.
- For situations considered less risky, because we are less likely to be exposed to them³, that is, cleaning all bathroom and kitchen surfaces and floors, increased usage ranged from 5% to 9%.

Hygiene fatigue or hygiene confusion?

Although the public were concerned about hygiene and the need to continue to practise hygiene even after the pandemic, misleading and conflicting messaging during the pandemic may have had a negative impact, causing omission of some key behaviours and adoption of additional practices of little benefit. Fatigue from trying to sustain rigorous environmental cleanliness or frequent handwashing in places where there was little impact may have deflected hygiene practices at key moments where it was actually needed.

During the pandemic, the public were encouraged to 'wash or sanitize their hands frequently' but given no clear indication of when hand hygiene is needed and why, or that it needs to be applied in combination with other actions.¹⁵ Table 1 shows that 10% of people were unclear about how they could be infected and 10% did not know when to wash their hands. Constantly being told to 'wash hands' without explanation of what 'frequently' means and how it prevents spread of infection may have encouraged the belief that skin penetration is a common route of infection. Although messages must be as simple as possible, they need to be tested to ensure the public do not misinterpret them. Frequent handwashing to prevent skin penetration may have been responsible for reports of skin problems due to excessive

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handwashing.^{16,17} Beliefs about skin penetration may also have prompted glove-wearing to prevent the hands becoming contaminated. Of respondents who believed wearing gloves is an effective measure, 77% believed the virus can infect by skin penetration. Of 31% who said they could be infected through the skin, 100% agreed glove-wearing is important.

Conflicting opinions between experts, communicated through the media, about 'why I'm cutting back on hand washing but keeping my mask on'¹⁸ and 'we need to double down on handwashing, everything else is irrelevant' may also have fostered confusion and distrust.¹⁹ At the start of the pandemic, public advice was against face coverings due to lack of clinical data supporting efficacy,²⁰ but this was later changed on the basis of risk modelling indicating significant infection risk reduction in community populations.²¹ Ongoing scientific debate about routes of transmission of COVID-19 infection is also likely to have eroded public trust.²²

It is possible that the public's belief about the need for deep cleaning and disinfection of environmental surfaces is partly the result of media images showing indiscriminate spraying of outdoor environmental surfaces and deep cleaning of indoor and outdoor premises, in the erroneous belief this can create a 'COVID secure' space.²³⁻²⁶

Failure of the public (and Public Health authorities) to understand that a risk-based approach means that, although a hazard (harmful microbes) may be present on hands, surfaces or in the air, the level of risk depends on likelihood of being exposed to them.^{3,27} Rather than trying to eliminate harmful microbes, hygiene advice needs to focus on reducing exposure throughout the day: those not exposed to microbes cannot become infected. This allows us to differentiate surfaces where pathogens represent a significant risk, from places where removal by cleaning and/or disinfection has little impact.¹⁻³

Overall polling data generated in UK and Europe in the last 4 years⁵⁻⁷ indicate the public would be receptive to more hygiene guidance but reveals that traditional methods of communication as used during COVID-19 are not fit for

purpose. The need is, not for more guidance, but more effective guidance, to develop practical knowledge and hygiene risk understanding, thereby rebuilding trust, fostering compliance and creating resilience.

Developing home and everyday life hygiene behaviour that meets current and future needs requires an acceptance that infection control guidelines for clinical settings (e.g. deep cleaning, glove-wearing) are not necessarily appropriate in everyday life settings, and vice versa. Home and everyday life hygiene must be addressed as a public health issue, where hygiene is about reducing population infection risk to an acceptable level.³

Getting change in hygiene behaviour through hygiene understanding

Since 1997, the IFH Targeted Hygiene approach has become widely accepted as a means to develop effective hygiene.¹⁻³ During the 2018 study,^{5,6} however it became apparent that although the public said they understand Targeted Hygiene, they did not. They interpreted it as the need to 'target hygiene practices in places (hands, surfaces) which they deemed to be risky', failing to realize it means 'targeting hygiene practices at the moments when there is risk of spread of harmful microbes'. Since 2018, IFH has been developing what has come to be known as the 'moments' approach as a means to overcome this misinterpretation.

Microbiological and behavioural assessment suggests there are nine key moments in our daily lives when harmful microbes are most likely to be spreading such that we can become exposed and infected (Figure 1).²⁸ Importantly, this approach communicates hygiene actions in the sequence in which the public need to receive them. It starts by identifying, first, the moments in our daily lives **WHEN** practicing hygiene is important (when handling raw foods, using the toilet, etc.), (Figure 1) and, second, the places **WHERE** we need to act at that moment (hands, surfaces, etc.). Third, it identifies **HOW** to practise hygiene in those places (handwashing, surface cleaning, mask wearing, etc.).²⁸

Targeted Hygiene works to communicate knowledge, that is, effective practice, in a way that builds cognitive understanding. Rather than prescriptive guidance, it can be communicated through visual images which work to tackle myths and misunderstandings, to engage, educate, nudge and empower the public to practice effective hygiene at each key moment.²⁸ An issue highlighted by COVID-19 is the importance of hygiene in our shared use of public spaces. After lockdown, offices, schools, restaurants, supermarkets and so on had to implement strategies to make facilities 'COVID secure'. However, preventing spread of infection depends on the public practising effective hygiene; facility managers can only do so much to facilitate good hygiene in their premises. This requires venue managers to not only take responsibility for cleanliness, but also enabling and encouraging the public to adopt Targeted Hygiene, as a continuum of such behaviour in their homes.²⁹

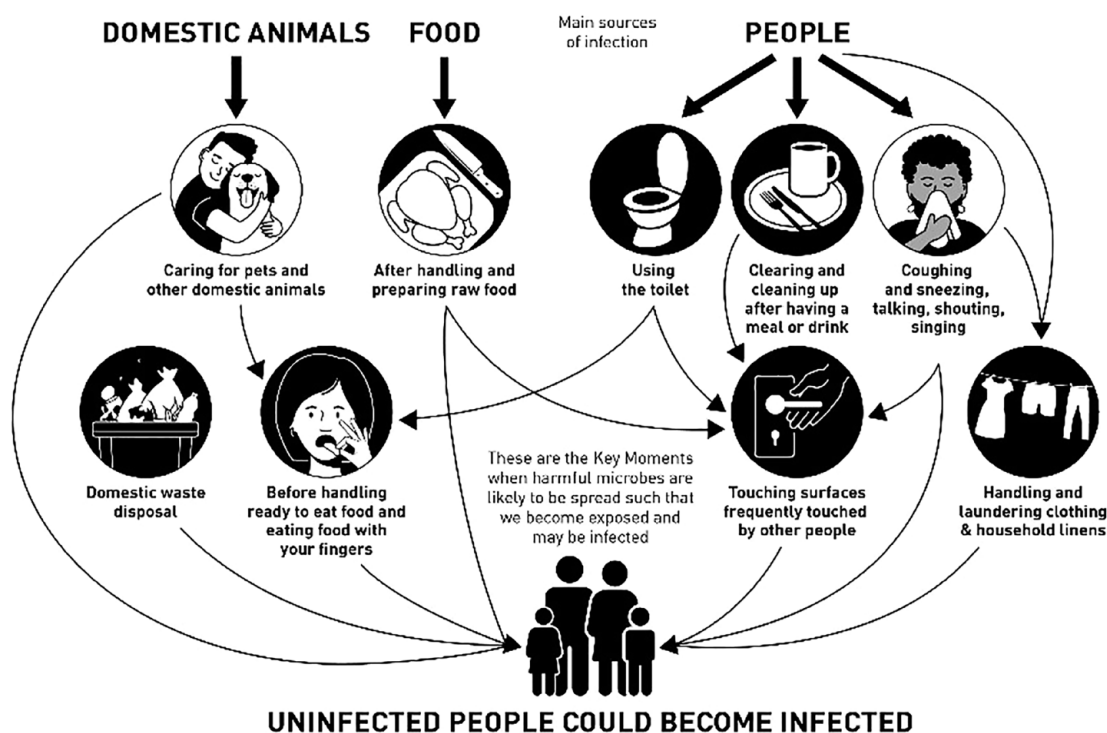
In this way, hygiene helps build sustainable health by avoiding unnecessary use of chemical products, thereby reducing environmental impacts. It is also less time-consuming and costly, and less likely to lead to hygiene fatigue and failure to sustain hygiene behaviours.

CONCLUSIONS

Although data from this and other polling carried out across Europe in the last 4 years⁵⁻⁷ indicate the public have high awareness of the importance of hygiene, it also suggests that they are vulnerable because of poor understanding of risk and the difference between hygiene and cleanliness.

New insights from public polling, together with the nine moments Targeted Hygiene approach, offer the opportunity to develop a more robust communications approach that enables the public to make cognitive links between when, where, how and why to practice good hygiene, and in doing so, promote more effective and sustainable behaviours. The 'when, where, how' framework works to build resilience to change because it is common to all

Figure 1

The key moments for hygiene in home and everyday life settings.

hygiene-related infectious diseases; it enables the public to easily understand, adapt and respond to 'enhanced', intensified or adjusted hygiene advice when necessary.

To be effective, behaviour change strategies must be accompanied by education on basic concepts of Targeted Hygiene and management of risk. This must include proactive communication to dispel convictions that routine cleaning (i.e. dirt removal) can keep homes hygienic (i.e. free from infection risks).

The last few years have seen development of the Health Belief Mode^{30,31} and COM-B³² for changing hygiene behaviours. Targeted Hygiene provides a practice policy for use with these models to deliver a key aspect of behaviour change, that of ensuring that the practices that are promoted are effective in protecting against exposure

to infection. Targeted Hygiene works to build '**Capability**' (knowledge) (i.e. effective practice communicated in a way that builds cognitive understanding), but is also a means to develop '**Motivation**' through positive, constructive messaging, and well-placed, accessible hygiene products, for example, hand sanitizers which maximize '**Opportunity**' to practice good hygiene at key moments.

Although questions in this poll were carefully formulated to avoid confusion, respondents will have answered them based on their understanding of terms and concepts such as hygiene, cleaning, disinfection and deep cleaning. Although online polling provides valuable data about the public's understanding of hygiene, further work is needed using direct approaches such as one-to-one interviews or focus groups, to get a more

in-depth understanding than can be achieved by polling.

CONFLICT OF INTEREST

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ETHICAL APPROVAL

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References

- International Scientific Forum on Home Hygiene. Developing and promoting hygiene in home and everyday life to meet 21st Century needs: what can we learn from the COVID-19 pandemic? 2021. Available online at: <https://ifh-homehygiene.org/developing-and-promoting-hygiene-home-and-everyday-life-meet-21st-century-needs>
- International Scientific Forum on Home Hygiene. Containing the burden of infectious diseases is everyone's responsibility: a call for an integrated strategy for developing and promoting hygiene behaviour change in home and everyday life, 2018. Available online at: <https://www.ifh-homehygiene.org/review/containing-burden-infectious-diseases-everyones-responsibility-call-integrated-strategy>
- Bloomfield SF, Ackerley LM. Developing resilience against the threat of infectious diseases and anti-microbial resistance: putting targeted hygiene into practice in home and everyday lives. *Public Health Pract* 2023;**5**:100362. Available online at: <https://www.sciencedirect.com/science/article/pii/S2666535223000083>
- Greenhalgh T, Fisman D, Cane DJ, *et al*. Adapt or die: how the pandemic made the shift from EBM to EBM+ more urgent. *BMJ Evidence-Based Medicine* 2022;**27**:253–60.
- Royal Society for Public Health. Too clean or not too clean? The case for targeted hygiene in the home and everyday life, 2018. Available online at: <https://www.rsph.org.uk/static/uploaded/06b37f30-2241-4e98-aba93fc15346e7a5.pdf>
- Bloomfield SF. RSPH and IFH call for a clean-up of public understanding and attitudes to hygiene. *Perspect Public Health* 2019;**139**(6):285–8.
- International Association for Soaps, Detergents and Maintenance Products. Developing household hygiene to meet 21st century needs: a collaborative industry/academia report on cleaning and disinfection in homes & analysis of European consumers' hygiene beliefs and behaviour in 2020, 2021. Available online at: <https://www.ifh-homehygiene.org/review/developing-household-hygiene-meet-21st-century-needs-collaborative-industryacademia-report>
- Royal Society of Public Health –IFH Survey. Yonder consulting, 2022. Available online at: <https://yonderconsulting.com/poll/royal-society-of-public-health-ifh-survey/>
- Department of Health and Social Care. A campaign is launching today to encourage the public to adopt good respiratory and hand hygiene practices – to 'Catch it. Bin it. Kill it' . . . , 2013. Available online at: <https://www.gov.uk/government/news/catch-it-bin-it-kill-it-campaign-to-help-reduce-flu-infections>
- Bradley Corporation. Healthy handwashing survey, 2020. Available online at: <https://www.bradleycorp.com/handwashing>
- Mengfei G, Li J, JScoles J *et al*. COVID-19 message fatigue: how does it predict preventive behavioral intentions and what types of information are people tired of hearing about? *Health Commun* 2022;**2022**:1–10.
- UK Government Cabinet Office. UK biological security strategy, 2022. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1055196/biological-security-strategy-cfe.pdf
- UK Government Cabinet Office. The national resilience strategy: a call for evidence, 2021. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001404/Resilience_Strategy_-_Call_for_Evidence.pdf
- International Scientific Forum on Home Hygiene. Perceptions of cleanliness, hygiene and hygiene issues: a survey of UK and US media coverage 1989 to 2017, 2017. Available online at: <https://www.ifh-homehygiene.org/review/perceptions-cleanliness-hygiene-and-hygiene-issues-survey-uk-and-us-media-coverage-1989/>
- Department of Health and Social Care. Public information campaign focuses on handwashing; washing hands for 20 seconds is central to the expanded public awareness campaign to prevent and slow the spread of coronavirus (COVID-19), 2020. Available online at: [https://www.gov.uk/government/news/public-information-campaign-focuses-on-handwashing#:~:text=Washing%20hands%20for%2020%20seconds,coronavirus%20\(COVID%2D19\).&text=This%20phase%20of%20the%20campaign,your%20nose%2C%20cough%20or%20sneeze](https://www.gov.uk/government/news/public-information-campaign-focuses-on-handwashing#:~:text=Washing%20hands%20for%2020%20seconds,coronavirus%20(COVID%2D19).&text=This%20phase%20of%20the%20campaign,your%20nose%2C%20cough%20or%20sneeze)
- Allure. Dermatologists note a rise in hand eczema due to coronavirus preventive handwashing, 2020. Available online at: <https://www.allure.com/story/hand-washing-eczema-rash-coronavirus>
- Times of India. Excessive hand hygiene practices causing skin complications: dermatologists, 2020. Available online at: <https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/excessive-hand-hygiene-practices-causing-skin-complications-dermatologists/articleshow/78692981.cms>
- Daily Mail. Why I'm cutting back on hand washing (but keeping my mask on), 2022. Available online at: <https://www.dailymail.co.uk/health/article-9819619/DR-MICHAEL-MOSLEY-Im-cutting-hand-washing-keeping-mask-on.html>
- Financial Times. Sanitation nation: how COVID created a home hygiene boom, 2021. Available online at: <https://www.ft.com/content/64cff467-4f0f-4755-9e65-be6d1fa4c42e>
- Daily Mail. Now Deputy Chief Medical Officer Jenny Harries says the evidence that masks stop the spread of coronavirus is 'not very strong in either direction', 2020. Available online at: <https://www.dailymail.co.uk/news/article-8676535/Jenny-Harries-says-face-coverings-evidence-not-strong.html>
- Edelstein P, Ramakrishnan L. Report on face masks for the general public – an update, 2020. Available online at: <https://rs-delve.github.io/addenda/2020/07/07/masks-update.html>
- Freeman A, Parker S, Noakes C *et al*. Expert elicitation on the relative importance of possible SARS-CoV-2 transmission routes and the effectiveness of mitigations. *BMJ Open* 2021;**11**(12):e050869.
- Thompson D. Hygiene theater is a huge waste of time. *The Atlantic*, 2020. Available online at: <https://www.theatlantic.com/ideas/archive/2020/07/scourge-hygiene-theater/614599/>
- Palmer M. Spray that costs pennies and kills viruses instantly could be a simple, cheap solution to Britain's COVID nightmare – as scientists ask why we're not already using it, 2020. Available online at: https://www.dailymail.co.uk/news/article-8558121/Spray-costs-pennies-kills-viruses-instantly-simple-solution-Covid-nightmare.html?ito=email_share_article-bottom%22%20%5Ct%20%22_blank
- Editorial. Coronavirus is in the air – there's too much focus on surfaces. *Nature* 2020;**590**:7.
- Centers for Disease Control and Prevention. Safety precautions when using electrostatic sprayers, foggers, misters, or vaporizers for surface disinfection during the COVID-19 pandemic, 2021. Available online at: <https://www.cdc.gov/coronavirus/2019-ncov/php/eh-practitioners/sprayers.html>
- Notermans S, Barendsz A, Rombouts F. The evolution of microbiological risk assessment. In: M Brown. M Stringer (ed.) *Microbiological risk assessment in food processing: series in food science, technology and nutrition*. Amsterdam: Woodhead Publishing; 2002. pp. 5–43.
- International Scientific Forum on Home Hygiene. Breaking the chain of infection in our homes and everyday lives: a practical approach to encourage effective Targeted Hygiene, 2022. Available online at: <https://www.ifh-homehygiene.org/online-learning/breaking-chain-infection-our-homes-and-everyday-lives-practical-approach-encourage>
- Bloomfield S. Hygiene resilience in public health – time for a fundamental rethink. *The House*, 2022. Available online at: <https://www.politicshome.com/members/article/hygiene-resilience-in-public-health-time-for-a-fundamental-rethink>
- Jones C, Jensen J, Scherr C *et al*. The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health Commun* 2015;**30**:566–76.
- Ackerley L. Consumer awareness of food hygiene and food poisoning. *Environ Health* 1994;**102**:69–74.
- Michie S, Van Stralen M, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;**6**:1–2.