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Preventing infectious diseases and tackling antibiotic resistance is everyone's responsibility - a call for an integrated strategy

There is no doubt that in the future we are going to have to view our microbial world very differently. Microbiome science is now showing us that the millions of microbes that live on and within us (the human microbiome) are as essential to our health as our liver and kidneys. Lack of exposure to the microbes in our human, animal and natural environments, the key to sustaining a diverse healthy microbiome, is now being associated with rising levels of allergic diseases (e.g. Asthma, eczema, food allergies), autoimmune diseases (e.g. multiple sclerosis), inflammatory bowel disease, type 1 diabetes, and other diseases. Avoiding our microbial world is no longer the healthy option.

Set against this, there is growing awareness of the vital importance of hygiene in preventing infectious diseases caused by exposure to harmful microbes. Not only are infectious diseases a significant burden of health and prosperity, hygiene is also crucial for tackling pressing health concerns such as reducing pressure on the NHS, and tackling antibiotic resistance by reducing the need for antibiotic prescribing.

Following a meeting in London In 2017, a group of experts in hygiene agreed to prepare a consensus paper summarizing why hygiene in home and everyday life is important and what needs to be done to address these apparently conflicting issues. The question which the paper sets out to solve is “how do we protect ourselves against harmful microbes whilst at the same time sustaining exposure to the diverse range of microbes that also inhabit our world and which are vital to health?”.

Key to this is understanding why we have lost contact with essential microbes. Is it a product of our success in reducing the burden of disease through water, sanitation and clean food and clean environments which has inadvertently reduced exposure to good as well as harmful microbes? Or is it something else? Most experts now agree that the rapid rise in allergic and other diseases in the last 50-60 years is largely down to changes in lifestyle. This includes increasing preference for C-section rather than natural childbirth, bottle rather than breast feeding, less sibling interaction and less time spent outdoors. Once acquired, factors like altered diet and excessive use of antibiotics can adversely affect our ability to sustain a healthy microbiome. Current evidence suggests that if personal and environmental cleanliness is involved, its contribution is likely to be small relative to the cumulative effect of these other factors. In short “being too clean” is not the answer.

Overcoming barriers to change

One of the things which became apparent in preparing this paper are the barriers to change which must be addressed if we are to be successful in promoting hygiene as part of tackling urgent public health issues.

A key problem is public confusion about hygiene - what it is and how it differs from cleanliness. Significant confusion arises because we still hold to the idea that dirt is the main source of harmful germs, and that hygiene means cleanliness aimed at eradicating dirt: in

other words, the belief that cleanliness and hygiene are the same thing. Although we now talk about “good germs” and “bad germs”, articles and infographics still represent them in a manner that engenders fear and the need to “search and destroy”. They fail to tell us that the largest proportion of the “millions of germs” that are found in our homes are mainly harmless and probably beneficial.

Another issue is the hygiene hypothesis, first published in 1989, which proposed that children who had more infections were less likely to develop allergies, and that this could be due to “improved household amenities and higher standards of personal cleanliness”. Although this concept has now been refuted (i.e. research shows that the exposures we need are to beneficial rather than harmful bacteria), widespread publicity given to the “hygiene” hypothesis in the 1990s has led to a prevalent conviction that we have become “too clean for our own good”. The idea that we need exposure to harmful germs to build a strong immune system is still being constantly repeated.

These issues have caused the public to become confused and distrustful about hygiene; it may be helpful to encourage children to spend more time playing outdoors and getting dirty, but messages such as “we must stop washing our hands”, which involve a significant risk of increased exposure to infection, are unacceptable

A further need is to balance evidence of the health benefits of hygiene against possible risks, such as environmental impacts and toxicity issues. Lack of a unified voice advocating hygiene means these issues can take precedence, leaving hygiene and its importance in second place. For example, we need to balance current trends towards reducing laundry temperatures (which cause a reduction in hygiene efficacy) against evidence showing that clothing and household linens in close contact with the body can be a means of spread of antibiotic resistant strains associated with our skin and bowel microflora. Concerns about whether, and to what extent, household disinfectants might contribute to development of antibiotic resistance must be properly weighed against the need for targeted use of disinfectants products in situations where other hygiene practices may be insufficient to prevent spread of infection.

To address all of these issues, however, we need a smarter approach to hygiene. Since 1980s the International Scientific Forum for Home Hygiene (IFH) has been developing a new approach which is called targeted hygiene.

Targeted hygiene – a framework for change

Targeted hygiene is a risk-management approach to hygiene in the home and everyday life. The aim is to focus our hygiene practices in places and at times when harmful microbes are most likely to be spreading (i.e. where there is risk) rather than regarding hygiene as “cleanliness aimed at eradicating dirt seen as the main source of harmful microbes”

This means recognising that the main sources of harmful microbes are not places which are ‘dirty’ but contaminated foods, domestic animals (pets), and people who are infected or are healthy carriers of potentially harmful microbes. Since the presence of these potential sources in the home is inevitable, this means the only way to protect ourselves from infection is by preventing the spread of harmful microbes from these sources. Research shows us that the main routes of spread of harmful microbes are via surfaces such as the hands, hand contact surfaces food contact surfaces and via cleaning cloths, which is where hygiene practices are the most important. Equally important, we need to be aware of the times when they are most likely to be spread i.e. the times when we need to practice hygiene. These occur during food handling, using the toilet, coughing, sneezing, nose blowing, care of domestic animals, handling and disposal of refuse, or where a family member is infected. In

short, getting people to adopt targeted hygiene means getting them to visualise the chain of infection, and understand that hygiene is about breaking it.

What targeted hygiene does is to balance the need to protect against infectious disease, whilst also addressing the various other issues. It provides a framework for maximising protection against infection whilst allowing maximum exposure to our microbial world. It also allows us to focus the use of resources (heat, water, mechanical action, detergents, disinfectants) in a manner which minimises environmental and other impacts.

Calls to action

In addition to making constructive recommendations for developing an effective approach to hygiene, this paper issues a call to health policy makers, health agencies & health professionals to recognize the need for an integrated, family-centred approach to hygiene, and provide effective leadership to achieve this. Also, a call to all hygiene stakeholders to work together, through research and communication policies. Collaboration between these groups is vital to overcome barriers to change and action behaviour change programmes that really work. Calls to action include:

1. Need for an integrated approach.

Although current investment in hygiene promotion provides a platform for change, strategies need to be integrated rather than developed independently. We need to look at hygiene from the point of view of the public and how they see it. i.e. food hygiene, toilet hygiene, laundry hygiene, respiratory hygiene are integrated daily life actions based on the same principles.

2. Overcoming barriers to change: public attitudes & behaviour

Unless & until we resolve public confusion about our microbial world and its relationship to health and disease, we will have limited success in changing hygiene behaviour. The public need:

- clear restatement of the importance of hygiene, and how to weigh hygiene importance against other risks
- a simple, plausible targeted approach to hygiene based on breaking the chain of infection

3. Overcoming Barriers to change: the need for a common approach.

Hygiene in home and everyday life must be given due recognition, relative to other issues. Stakeholders including scientists, health professionals, the private sector, allergists, microbiologists, environmentalists, regulators, media need to:

- work to agree common approach
- stop ignoring evidence & embracing misinformation to downplay or exploit hygiene in favour of other agendas
- ensure consistent clear messaging to public

4. Strengthening the evidence base for home and everyday life hygiene.

Lobbying for an effective approach to hygiene requires a strong evidence base. Academia and the private sector need to work together to develop hygiene products and procedures which are effective, not just in destroying or removing harmful microbes, but are demonstrably effective in breaking the chain of infection transmission

NOTES

- The full paper can be downloaded from : <https://www.ifh-homehygiene.org/review/containing-burden-infectious-diseases-everyone%E2%80%99s-responsibility-call-integrated-strategy>
- For media and other enquiries please contact secretariat@ifh-homehygiene.or. If your media enquiry is urgent please call 0791 955 4781
- **The International Scientific Forum on Home Hygiene** is a not-for profit, non government organisation which was established in 1998, and is working to develop and promote hygiene in home and every day life based on sound scientific evidence (www.ifh-homehygiene.org)