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IFH Newsheet April 2019

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[1. News from IFH](#)

1.1 IFH website

Have a look at our updated [IFH website](#). On our website you can find a broad range of up to date information on home and everyday life hygiene including scientific reviews, guidelines, training resources and fact sheets, together with the latest news and new research publications. The website contains materials produced by IFH and materials from other respected sources.

1.2 The hygiene hypothesis - a misnomer which is undermining public health

In a [presentation](#) given at the Microbiology Society Annual Conference, Professor Sally Bloomfield sets out what needs to be done to achieve hygiene behaviour change whilst also addressing need for exposure to essential microbes.

The ‘hygiene hypothesis’ first cited in 1989 proposed that lack of exposure to childhood infections due to smaller family sizes, improved household amenities and higher standards of personal cleanliness were underlying causes of rising allergies. Despite agreement that this hypothesis is a misnomer and the exposures needed are largely non harmful “Old Friends” microbes, and that the underlying causes are lifestyle changes such as C-section childbirth, less time outdoors, altered diet, too many antibiotics etc, the idea that hygiene and cleanliness is the problem still persists in the minds of the public and the media and is undermining attitudes to hygiene and its importance.

A [survey](#) by the IFH found that, of 25 news articles published since 1998, 20 continued to cite hygiene as a cause of reduced exposure to friendly microbes and 10 cited the “hygiene hypothesis” as explaining the link to immunological disorders. Continued promotion of this misnomer is making the public confused and distrustful about hygiene. What’s most worrying is that this is happening at a time when hygiene is becoming more important.

It is now time to stop using this simplistic misnomer to describe a highly complex issue which has profound implications for health. We need to work to restore public confidence in hygiene. The important news is that empowering us to practice good hygiene in order to take care of our own health, including reducing the need of antibiotic prescribing is now a part of government health strategy and the new UK 5 year plan for tackling antibiotic resistance. By contrast the hygiene hypothesis is fake news - like linking measles vaccination and autism – which is

undermining public health.

2. Safeconsume - reducing health burden from food borne illnesses

2.1 Safeconsume annual partner meeting April 1-6 2019

Safeconsume held its 3rd annual workshop in Porto, Portugal to review progress and plan ongoing activities. SafeConsume is a 5 year project funded by Horizon2020 and coordinated by [Nofima](#). The project has 32 partners in 14 countries in Europe. The background for the project is the need for new strategies to help consumer mitigate food risks. Hazards in food accounts for about 23 million cases of illness and 5000 death in Europe every year. Nearly 40 percent of food borne outbreaks are domestic/kitchen outbreaks and food safety violations at the consumer stage are common, particularly due to poor hygiene and insufficient heating and cooling. The objective is to change consumer's behaviour to reduce exposure to hazards and decrease risk through:

- effective and convenient tools and products
- information strategies
- education
- inclusive food safety policy.

To learn more about safeconsume go to www.safeconsume.eu

2.2 Food Safety Myths: How do Mythical Beliefs Influence Behaviour?

During the workshop Nina Veflen gave a presentation about food safety myths. Although 30-40% of food borne diseases occur due to bad practices at home, the reasons for this are not well understood. It was decided to carry out a study evaluating whether mythical, non-scientific beliefs of what is perceived to be proper food handling can explain some of these unsafe practices. The study was carried out on a representative household sample from UK, Germany, Norway (1000 interviewees per country). The questions covered 6 food hygiene issues: shopping, storing, hygiene, preparation/cooking, eating and reuse. Some of the most widely held views were: "nationally produced food is safer than imported food" (55%), "exposure to bacteria keeps your immune system strong" (67%), "being too clean is the cause of allergies" (56%). "it is best to cook poultry and vegetables separately before mixing, as bacteria from raw poultry may go inside vegetables if cooked together" (67%), "vitamins are not heat-stable. If you treat healthy foods with too much heat they lose their healthiness" (65%), " If the food smells and tastes fine it is safe to eat" (60%). There were however significant difference between

different countries.

3. Hygiene Forum 2019 Infection prevention: it starts with YOU!

Human behaviour on hygiene, regardless of whether in healthcare, institutional, manufacturing or home and everyday life settings, is influenced by people's knowledge about hygiene and infection prevention. The third hygiene forum meeting will take place on **15 October 2019** in Ede, Netherlands hosted by the Netherlands Organisation NVZ. The aim is to bring together scientists, health professionals, policy makers, regulators, executors of hygiene protocols, R and D and quality control managers from all sectors, to exchange and disseminate information on hygiene and hygiene issues. In the morning there will be a plenary session. In the afternoon there will be various, more in depth workshops, running in parallel to provide participants with more in-depth knowledge on how hygiene can be achieved and maintained in specific areas (e.g. healthcare, public healthcare, food supply chain, animal husbandry, farming).

For more details and to register go to <http://www.hygieneforum.nl/en>

4. News and new research

4.1 Impact of hygiene on virus spread in an office building

This study quantified a wellness intervention to reduce viral contamination in offices. It included using a spray disinfectant on high-touch surfaces, and providing workers with alcohol-based hand sanitizer gel and hand sanitizing wipes along with user instructions. Viral transmission was monitored by applying MS2 phage to a door handle and the hand of a volunteer. Results showed that the intervention significantly reduced viable phage/surface area on hands, shared fomites, and personal fomites with an 85.4% average reduction. Surfaces identified as most contaminated were the refrigerator, drawer handles and sink faucets in the break room, along with pushbar on the main exit of the building, and soap dispensers in the women's restroom. A comparison of contamination in different locations showed that the break room and women's restrooms were the sites with the highest tracer counts.

The study was carried out to provide data for use in quantitative microbial risk assessment (QMRA) models aimed at defining the relationship between surface contamination, pathogen exposure and the probability of disease. This latest data from Reynolds et al is a further example of how QMRA can be used to develop hygiene procedures which are both effective and sustainable, as outlined in the recent IFH white paper: [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.](#)



Kurgat EK, Sexton JD, Garavito F, Reynolds A, Contreras RD, Gerba CP, Leslie RA, Edmonds-Wilson SL, Reynolds KA. [Impact of a hygiene intervention on virus spread in an office building.](#) International journal of hygiene and environmental health. 2019 Jan 15. DOI: 10.1016/j.ijheh.2019.01.001

4.2 Domestic pets – are they good or bad for our health?

In March we saw publications of two apparently conflicting research papers, one saying that having domestic pets is good because it reduces the risks of allergy – the other warning that they pose an infection risk. These studies indicate the importance of keeping new research findings in perspective. Having pets at home may be good because it helps us to become exposed to friendly microbes which help to regulate our immune system, but it's equally important that that we practice good hygiene to ensure we are not exposed to harmful microbes they may also carry.

The first study of 1278 children in Sweden found that, as the number of pets living with the child during its first year of life increased from zero to 5 pets, subsequent development of allergic disease (asthma, allergic rhinoconjunctivitis, or eczema) in these children at age 7–9 years decreased. It is postulated that exposure to microbes from the natural environment are important for regulating the immune system so that it does not overreact to

allergens causing allergies, and that pets help to bring these organisms into the home.

In the second study, 60 packs of raw meat products, intended for dogs, bought from retail stores were sampled. Raw meat diets have become popular in recent years, because it is seen as a 'healthier' and more 'natural alternative'. Unlike commercial feeds, raw meat products are not heat treated or freeze dried to pasteurise their content. The products originated from Sweden, Norway, Finland, Germany or England. *Salmonella* species were found in 4 (7%) of the 60 samples, while *Campylobacter* species were found in 3 samples. All 60 samples contained *Enterobacteriaceae* spp. which are indicators of poor hygiene standards. Of the 60 samples 31 contained levels exceeding thresholds set by EU regulations of 5000 bacteria/g.

The authors conclude that pet owners who choose a raw food diets must be made aware of the risks and take full precautions while storing and handling the food. Bacteria in juices from dog food can splash and spread to other foods and surfaces, and dogs can transfer harmful bacteria by 'kissing' faces after eating. Pets, fed with these foods can shed these organisms in their faeces, so there is risk to owners in handling the food and coming into contact with the animal. Hand washing after handling animals, before touching or eating food is vital and it is important to keep and clean pet feeding utensils separate from family utensils.

An IFH fact advice sheet on pet hygiene can be found at <http://www.ifh-homehygiene.org/factsheet/home-hygiene-pets-and-other-domestic-animals>

The research publications can be found at: Hesselmar B, Hicke-Roberts A, Lundell AC, Adlerberth I, Rudin A, Saalman R, et al. (2018) Pet-keeping in early life reduces the risk of allergy in a dose-dependent fashion. PLoS ONE 13(12):e0208472. <https://doi.org/10.1371/journal.pone.0208472>

Josefin Hellgren, Lovisa Staaf Hästö, Camilla Wikström, Lise-Lotte Fernström, Ingrid Hansson. [Occurrence of *Salmonella*, *Campylobacter*, *Clostridium* and *Enterobacteriaceae* in raw meat-based diets for dogs.](#)

Journal Vet Record 2019. doi 10.1136/vr.105199

4.3 Graham Rook and the Hygiene hypothesis – a podcast review of current thinking

At the end of January Professor Graham Rook did a podcast on current thinking about this issue. It's well worth a listen. In the podcast he traces growing awareness of the fundamental importance of the microbial world in which we live, and which lives within us (the human microbiome), to our health and how altered interaction with our microbial world is underlying a whole range of diseases, not just immunological diseases, which have rapidly increased in recent years.

In talking about how microbes interact with our immune system, he likens the immune system to a computer programme i.e. we are borne with a fully functioning immune system but it lacks data. Programming by exposure to microbes is vital to ensure that it reacts to things which are potentially harmful, but tolerates those which need to be tolerated. Talking about the types of organisms we need – he is clear that these are not the common “crowd infections” of childhood which hygiene and vaccination measures were developed to control – as the 1989 hygiene hypothesis proposed. He says “These appeared much too late in our evolutionary history to have evolved an essential role in the development of human immune systems. The organisms that we require are the microbiota of our mothers, and organisms from the natural environment”. Professor Rook calls this concept the “Old Friends mechanism”.

Answering the question “What’s gone wrong” Professor Rook is again very clear that it’s not “too much hygiene and cleanliness”. “Promoting this simple message is just wrong and has major health implications”. He says problem is probably the combined effect of a whole range of lifestyle factors such as the preference for C-section childbirth, less breast-feeding, smaller family sizes, altered diet, less time outdoors in the natural environment, - he says “One of the most important factors is likely to turn out to be the widespread use of antibiotics and its adverse effects on the microbiome and its diversity”

The podcast can be found
at: <https://soundcloud.com/adoseofnaturepodcast/a-dose-of-nature-podcast->

4.4 Bacterial biocide resistance: a scourge of the infectious disease world?

This paper is a new review of research into antimicrobial resistance – both resistance to microbiocides and also antibiotics caused by exposure to microbiocides. Studies continue to show that biocides are effective in most situations but may fail when used incorrectly. Following suboptimal exposure, bacteria can develop increased tolerance to commonly used biocides via mechanisms that can, in some cases, confer cross-resistance to antibiotics. It can also occur by co-selection of biocide and antibiotic resistance genes located on the same mobile elements. So far, most evidence of biocide adaptation is based on laboratory findings, but there are indications that these may be relevant to the clinic, an aspect that needs further investigation.

As Lucy Bock concludes, the link to cross-resistance and co-selection of resistance to antibiotics is probably the most worrying aspects of biocide adaptation, but is only becoming obvious now we are beginning to describe some of the biocide resistance mechanisms. The lack of clinical examples of cross-resistance, co-selection and increased biocide tolerance, therefore, does not prove that these do not occur, rather that lack of knowledge of mechanisms of biocide resistance has not allowed such studies to be conducted.

Bock, Lucy. (2019). Bacterial biocide resistance: A new scourge of the infectious disease world?. Archives of Disease in Childhood. archdischild-2018. 10.1136/archdischild-2018-315090. It can be downloaded from https://www.researchgate.net/publication/330765993_Bacterial_biocide_resistance_A_new_scurge_of_the_infectious_disease_world

4.5 Environmental contamination after flushing toilets contaminated with *Clostridium difficile*

A new study shows that toilets contaminated with *C difficile* spores are a persistent source of environmental contamination. A flushometer toilet was seeded with *C difficile* spores in a sealed chamber. The toilet was flushed 24 times, with postflush bowl water samples and surfaces sampled periodically to determine levels of *C difficile* spores. Air samples were collected after each of

12 flushes. Results showed that spores were present in bowl water even after 24 flushes. Large droplet spore deposition accumulated over the 24-flush period. Droplet nuclei spore bioaerosol was produced over at least 12 flushes. The report can be found at [https://www.ajicjournal.org/article/S0196-6553\(18\)31098-8/fulltext#.XBeyfxQzeJk.twitter](https://www.ajicjournal.org/article/S0196-6553(18)31098-8/fulltext#.XBeyfxQzeJk.twitter)

4.6 Beat the Bugs: a community education course on hygiene, self-care and antibiotics – a pilot study

The e-bug team have carried out a pilot study [Beat the Bugs](#), a learning programme designed to give communities knowledge and confidence to manage their own infection and change behaviour around hygiene, self-care and antibiotics.

Pilot courses with 9–12 adults with learning difficulties and young parents were delivered by community leaders and observed by researchers.



Participants completed before and after knowledge questionnaires. Two participant focus groups and two course leader interviews explored views on the course and retention of knowledge.

Completed questionnaires and qualitative results showed an improvement in participant knowledge in each session; microbes and antibiotics sessions showed the greatest knowledge improvement. Self-care showed the greatest knowledge retention and participants reported behaviour change including an increase in appropriate hand-washing. The UK Five Year Antimicrobial Resistance Strategy outlines seven key areas for future action including improving public knowledge and understanding of antimicrobial resistance through education. e-Bug supports this key area for action by educating children and young people and is endorsed by the National Institute for Health Care Excellence.

Eley CV, Young VL, Hayes CV, Parkinson G, Tucker K, Gobat N, McNulty CA. [A mixed methods pilot of Beat the Bugs: a community education course on hygiene, self-care and antibiotics.](#)

Journal of Infection Prevention. 2018 Nov;19(6):278-86.

4.7 How capitalism has ruined our relationship with bacteria

There are many rational reasons why consumers spend huge sums on household cleaning products, but some are non-rational mechanisms. Adverts for hygiene products usually follow the same simple yet powerful theme - the threat of bacterial contamination - and the protection

that anti-bacterial gels, soaps, fluids, powders or foams offer. This has led us to a limited, and dangerous relationship with bacteria. This issue is explored in a [recent issue of The Conversation](#) by Norah Campbell and Cormac Deane.

The authors consider how bacteria are portrayed visually. For the public, bacteria do not appear in a realistic way, but comes through advertisements for antibacterial products. [Analysis of advertising images](#) showed four broad conventions which showed how our relationship with this part of earth's biome is subject to the aims and desires of cleaning product manufacturers.

1. Cute bacteria

Bacteria are cute, vulnerable and toy-like. This is strange, considering that advertisements for bacterial products are persuading us to kill them. But the cute object evinces a range of negative effects like helplessness and pitifulness. These summon complex reactions of resentment at being emotionally manipulated, contempt for their weakness and disgust, which places them as objects below ethical consideration, so we feel no remorse in eliminating them.

2. Overpopulated bacteria

Bacteria flourish in billions. This can awaken fears of overpopulation. Bacteria continue to be, a channel for fears about overpopulation, immigration and the corruptive influence of living too closely with millions of others.

3. Poor bacteria

Bacteria are seen to live in squalor and poverty. Their skin is slimy, their teeth and skin are dirty. This is in contrast with the consumer who uses antibacterial products. While "they" are lower-class, grimy and slothful, the antibacterial person is middle-class, reassuringly clean.

4. Sexual bacteria

Bacteria seem to have no regard for "proper" sexual behaviours. People who fail to use antibacterial products are associated with promiscuous, non-reproductive sexual behaviours.

From their research the authors drew the following conclusions:

- That bacteria are a vehicle for fears of what we might be, and of aspects of ourselves and our society that we find it difficult to confront directly.
- This has disastrous consequences for our planet and the things that live on it, including us and bacteria.

- The visual vocabulary of fear, disgust and dread that has been so effective at selling antibacterial products has brought us to an ecological dead end.
- A totally new understanding of bacteria as a realm that we must live within is needed. An important step in that direction is describing the destructive ways of thinking about bacteria that have stepped in between us and these necessary cohabitants of our planet

4.8 The neglected element of hand hygiene - significance of hand drying, efficiency of different methods and clinical implication: a review

Hand hygiene is a fundamental strategy for controlling spread of infection. Hand drying is integral to the process of hand hygiene, which aims to optimise the removal of potentially pathogenic microorganisms. Ineffective hand drying results in wet hands that are an infection risk increasing the potential for cross-infection, occupational contact dermatitis for healthcare practitioners, harm to patients and environmental contamination.

Evidence indicates that there has been limited research regarding the efficacy of hand drying and the clinical impact of different drying methods. The purpose of this review paper was to scope and evaluate existing literature on hand drying; to examine clinical consequences associated with wet hands for patients, healthcare practitioners and the clinical environment; to assess the efficacy of different drying methods; to consider the impact on patient safety. Twenty-one papers identified from 112 abstracts screened were included in the review. Analysis identified three primary themes emerging from the literature: (1) efficacy of hand drying methods; (2) drying method and microbial translocation, dispersion and environmental contamination; and (3) drying methods and environmental sustainability. This review highlights the equal importance of hand drying in the process of hand hygiene and suggests that efficacy of hand drying is a critical factor in preventing transfer of microorganisms to the environment, and from person to person following hand washing. The paper argues that greater attention needs to be given to hand drying in terms of practice, policy and research and its importance in clinical settings given greater focus.

First Published December 5, 2018 Review Article by [John Gammon](#), [Julian Hunt](#)

<https://doi.org/10.1177/1757177418815549>