

# Importance of disinfection as a means of prevention in our changing world hygiene and the home

## Die Bedeutung der Desinfektion als Prophylaxe – Instrument in einer sich ändernden Welt: "Alltagshygiene"

### Abstract

Contrary to expectation, the risks of infection are growing rather than declining, even in everyday life. After all, who is able to make a distinction between cleanliness and hygiene? This situation is further compounded by the growing number of persons who are susceptible to infections. If one wants to combat infectious diseases in an economically feasible and consistent manner, public support must be sought. In turn, the public have a right to be informed in a proper and responsible manner. The difference between "dirt" and "contamination" must be highlighted once again.

To create a forum for everyday hygiene, an international expert working group was set up (<http://www.ifh-homehygiene.org>). The hallmark of this group is its holistic view of hygiene in the family setting, something that is not true in the case of most public health sectors. Based on the latest study results, the International Forum for Hygiene (IFH) has coined a new motto "Selective Hygiene", and evaluates the causes of infection so as to be able to react in an appropriate manner. The aim cannot be routine, daily repetitive decontamination of all potentially dangerous microbes that are found in a normal household, but rather selective reaction to important transmission processes, i.e. hands and foodstuffs, kitchen, bathroom and toilet. The motto can be summarized as follows: "Do the right thing at the right time". This, however, calls for an understanding of the risks and of effective procedures for microbial reduction. Depending on the respective circumstances, hands can be washed with running water or by using a hand disinfectant.

Even experts must learn that hygiene in the home must be evaluated differently from that of the hospital setting. The comparatively lower risk is offset by markedly less awareness of the risks involved. These risks can be significantly increased by any members of the household who are ill. Hence in some cases it is advisable to use disinfectants in the home too – even if it is claimed in certain quarters that we have become "too clean", and have thus lower immunity. Study data demonstrate that disinfectants have become indispensable in the household in the context of "selective hygiene strategies" so as to prevent infectious diseases.

### Zusammenfassung

Die Infektionsrisiken nehmen, anders als angenommen, nicht ab, sondern zu, auch im normalen Alltag. Wer kennt da auch schon den Unterschied zwischen Sauberkeit und Hygiene? Dazu kommt, dass die Zahl der Personen, die anfällig gegenüber Infektionen sind, zunimmt. Wenn man Infektionskrankheiten wirtschaftlich und nachhaltig bekämpfen will, muss die Öffentlichkeit mitmachen, die andererseits wieder korrekt und verantwortungsbewusst informiert sein muss. Der Unterschied zwischen „Schmutz“ und „Kontamination“ muss wieder präsent gemacht werden.

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Um der Alltagshygiene ein Forum zu geben, hat sich eine internationale Expertengruppe gebildet (<http://www.ifh-homehygiene.org>). Das Charakteristikum der Gruppe ist, anders als in den meisten öffentlichen Gesundheitswesen, deren ganzheitliche Sicht auf die Hygiene für die Familie. Basierend auf aktuellen Studienergebnissen hat IFH einen neuen Ansatz entwickelt: „Gezielte Hygiene“ gewichtet die Infektionsursachen, um angepasst zu reagieren. Das Ziel kann nicht die routinemäßige, täglich wiederkehrende Dekontamination aller möglichen potenziell gefährlichen Keime sein, die sich im normalen Haushalt finden lassen, sondern die gezielte Reaktion auf wesentliche Verbreitungsprozesse, also z.B. Hände und Lebensmittel, in Küche, Bad und Toilette. Das Richtige zur richtigen Zeit zu tun, ist das Motto. Dazu gehört dann allerdings die Kenntnis der Risiken bzw. wirkungsvoller Prozeduren der Keimverminderung. Je nach den örtlichen Gegebenheiten kann das das Händewaschen unter fließendem Wasser oder der Gebrauch eines Hände – Desinfektionsmittels sein.

Selbst Experten müssen lernen, dass Hygiene für den Alltag anders zu beurteilen ist als im institutionellen Bereich. Ein vergleichsweise geringes Risiko steht andererseits einem weitaus geringeren Risikobewusstsein gegenüber. Kranke Mitbewohner können das Risiko z.B. bereits erheblich vergrößern. Es kann also in manchen Fällen sinnvoll sein, Desinfektionsmittel auch im Haushalt anzubieten – selbst wenn manche behaupten, wir wären „zu sauber“ geworden und daher geschwächt in der Abwehr. Studiendaten belegen, dass Desinfektionsmittel im Rahmen der „gezielten Hygiene-Strategien“ für Haushalte unverzichtbar sind, wenn es darum geht, Infektionskrankheiten zu verhindern.

## Text

For a time during the 20<sup>th</sup> Century, ready access to water and sanitation, combined with the availability of vaccines and antibiotics, seemed to offer the possibility that infectious disease (ID) would someday become a thing of the past. As a result hygiene has received declining attention in recent decades. Nowhere is complacency about hygiene more evident than in the home. Now at the turn of the century, ID is moving back up the health agenda. Current concerns focus on foodborne, waterborne, and other infectious intestinal diseases, which remain at unacceptably high levels, on antibiotic resistance which compromises treatment of bacterial diseases, on viral agents which are not treatable by antibiotics, and on new agents (e.g SARS, flu) and their potential for rapid global spread. Pathogens are also now increasingly implicated as co-factors in cancers and some degenerative diseases. In the developing world there is consensus that, one of the past mistakes, has been to give priority to water over sanitation and to sanitation over hygiene. In reality it is hygiene (e.g. keeping faecal matter away from hands, food and water, preventing cross contamination etc.) that reduces the burden of ID. Of particular concern, both in developed and developing countries is the rising proportion of the population who are more vulnerable to infection. This includes the elderly, the very young, people with chronic or degenerative illness; and immuno-compromised patients discharged from hospital. Currently, about 1 in 6 persons in the UK belongs to an 'at risk' group,

and it is likely that the same applies in most European countries. All of these groups, together with family members who carry HIV/AIDS, are increasingly cared for at home. If ID is to be contained in a manner that is economically sustainable, responsibility for hygiene must be shared by the public, who in turn must be properly and responsibly informed. Complacency about home hygiene has led to a lack of understanding of the basic difference between “dirt” and “germs”, between “cleanliness” and “hygiene”, and between “cleaning” and “disinfection”. The confusion has fostered the idea that hygiene means creating a “germ-free” home.

Although there is awareness amongst public health scientists about the importance of renewed emphasis on hygiene, this does not necessarily translate into commitment to action by national and international government and non-government agencies. A significant barrier to progress is the fact that, in most countries, the separate aspects of hygiene (household water, safe faeces disposal, food hygiene, handwashing, care of “at risk” groups, etc.) are dealt with by separate agencies, with the result that hygiene promotion tends to be fragmented and ineffective. Growing interest about home hygiene has led an international group of experts to form the International Scientific Forum on Home Hygiene (IFH; <http://www.ifh-homehygiene.org/>). A key feature of IFH is that it looks at hygiene holistically from the point of view of the family and the range of problems they face in order to reduced ID risks.

In the past few years, research studies focussing on the home have given us a better understanding of how ID is spread in this environment, and how the risks can be re-

duced. Using this data, IFH has developed an approach to home hygiene based on the concept of risk assessment and risk prevention. This approach is now well accepted as the most cost effective means of infection control in hospitals, food manufacturing, and other settings. "Targeted hygiene", as it has come to be known, starts from an acceptance that homes always contain harmful microbes (from people, pets, food, etc.) and that good hygiene is not about eradicating them through day to day cleaning, but about targeting measures in the places and at the times that matter, in order to limit risks of exposure. Since targeted hygiene focuses on preventing spread of germs, major target sites in the home are the hands and hand and food contact surfaces in the kitchen, bathroom and toilet. Cleaning cloths are also critical factors. Intervention at the appropriate time (i.e. during raw food handling, rather than as part of daily routine) is an equally fundamental part of targeted hygiene.

Access to safe and effective hygiene procedures for reducing these risks is also a part of targeted hygiene. Since evidence now shows that the "infectious dose" for many common pathogens such as *Campylobacter*, norovirus and rhinovirus can be very small (1-500 particles or cells) intuitively one must argue that, in situations where there is significant risk (e.g. during food preparation), the aim should be to get rid of as many germs as possible from sites and surfaces involved. In general, for cooking and eating utensils and the hands, the evidence suggests microbial contamination can be effectively removed using soap or detergent and hot water. However, since this process relies on mechanical removal of microbes, to be effective it must be applied in conjunction with a rinsing process. A range of studies now show that, although cleaning surfaces with a cloth or mop removes a large proportion of the bacteria or viruses present, it also spreads residual cells or particles in significant numbers around the surface and onto the cloth to be spread to other surfaces. This suggests that, in situations where thorough rinsing is not an option, and where failure to achieve hygiene carries serious risks (e.g. food hygiene), use of a disinfectant product or a heat process which kills germs is advisable.

In devising hygiene policy it must be borne in mind that the home is fundamentally different from hospitals and other settings. The availability of data focussing on the home now allows us to do this. Although infection risks may be less than in hospitals, the level of understanding of hygiene may be poor. Facilities for maintaining hygiene e.g. kitchen facilities may be inadequate, overcrowding may be a problem, and domestic animals are an added risk. In addition there may be family members who are more vulnerable to infection, or who pose an infection risk to others. For these reasons also, it may be advisable, for certain situations, to recommend hygiene procedures which carry a higher margin of safety such as those involving a disinfectant product.

In formulating home hygiene policy we must also be mindful of concerns about antimicrobial resistance, and the possible impacts of cleaning agents and disinfectants

on the environment. A further issue is the hypothesis which proposes that, a major cause of the rising incidence of allergic disorders that has occurred over the last 30 years, is declining microbial exposure. Because it is called the hygiene hypothesis, the popular notion has arisen that it is because we are "being too clean". This is despite the fact that there is no good evidence to support this latter suggestion, or the hypothesis that overuse of disinfectants may contribute to development of antibiotic resistance in clinical practice. All of these issues have the potential to seriously undermine our attitudes to hygiene. Although they cannot be fully resolved in view of our incomplete picture of the scientific facts, perhaps it is time that we stop focusing on them as separate issues, and look at them in the context of the importance of ID and the need for effective prevention. Whatever the reality about the hygiene hypothesis, antimicrobial resistance and so on, the "targeted hygiene" approach as described above offers a way forward, because it seeks to maximise protection against ID, whilst disturbing the normal balance of our human and natural environment to the least extent. The data suggests that, when used as part of a targeted approach to hygiene, disinfectants have a role to play in preventing infection transmission in the home.

## Curriculum Vitae

### Professor Sally Bloomfield

Figure 1



Figure 1: Sally Bloomfield

Consultant in Infectious Disease and Hygiene, Chairman and Member of the Scientific Advisory Board of International Scientific Forum on Home Hygiene, Honorary Professor at the London School of Hygiene and Tropical Medicine.

Professor Bloomfield was awarded the Rudolf Schuelke Hygiene Prize in 1995, for her outstanding contribution in the field of Hygiene and Preventive Medicine.

She has been a member of several UK and international bodies including Comité Européen de Normalisation – CEN TC 216 – Antiseptics and Disinfectants.

Professor Bloomfield has published widely with over 100 publications in peer review journals and contributions to edited works.

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**Please cite as**

Bloomfield SF. Importance of disinfection as a means of prevention in our changing world hygiene and the home. *GMS Krankenhaushyg Interdiszip.* 2007;2(1):Doc25.

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