

# SMALL STEPS FOR BIG CHANGE

## MISSION STATEMENT

The Global Hygiene Council is committed to driving worldwide behaviour change in hygiene practices to reduce the burden of common infectious diseases.

There has never been a greater focus on the health and well-being of children, yet, every single day, the health of the world's children is under attack from common infectious diseases which could be prevented through improved hygiene practices.

The Global Hygiene Council (GHC) has developed this report to highlight the burden of common children's infections on health, the family and society and to review the macro threats posed to the world's children. The report will recommend simple steps that can deliver big change, helping to reduce the millions of preventable deaths of children and babies each year from common infections such as pneumonia and diarrhoea.

Experts in the fields of paediatric infectious disease, microbiology, hygiene and health have come together to highlight what they perceive as the greatest threats to paediatric health today and in the future. They hope that together we can all make small steps to improve hygiene and help protect children from preventable infections that could prove fatal.

## GLOBAL INFECTIOUS DISEASE AND CHILDHOOD MORTALITY AND MORBIDITY

Child mortality has fallen considerably over the last 20 years, from 12 to 5.9 million, yet more than 17,000 children still die every day, primarily from preventable and treatable infectious diseases.<sup>1</sup>

Recent estimates suggest that nearly 50% of deaths among children under 5 years old occur in Sub Saharan Africa and South Asia especially India, Nigeria, Democratic Republic of Congo, Pakistan and China.<sup>2</sup>

**3.2**  
MILLION CHILDREN  
UNDER THE AGE OF 5  
DIE FROM INFECTIOUS  
DISEASES EACH YEAR.<sup>3</sup>

**922,000**  
CHILDREN DIE  
EACH YEAR FROM  
PNEUMONIA.<sup>3</sup>

**760,000**  
CHILDREN UNDER 5  
DIE EACH YEAR FROM  
DIARRHOEA.<sup>4</sup>

Poor personal and home hygiene practices are widely recognised as the main causes of infection transmission for colds, flu and diarrhoea. Hands, for example, can carry 3,000 different bacteria<sup>5</sup> and yet inadequate hand hygiene practices are estimated to affect 80% of the global population.<sup>6</sup>

It is now widely recognised that the prevention and control of diarrhoea and pneumonia can only be tackled through integrated global and country specific programmes aimed at improving family hygiene practices at home and in the community.<sup>7</sup> While in developed countries the frequency of death from common infection is significantly lower, education on good personal and home hygiene practices is just as important. There is also a significant socioeconomic impact, including days lost from school and time taken off work by parents in order to care for sick children.



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HANDS  
CAN  
CARRY  
3,000  
DIFFERENT  
BACTERIA<sup>5</sup>

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# THE BURDEN OF PAEDIATRIC INFECTIONS

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It is unacceptable that largely preventable infections such as diarrhoea are still one of the biggest killers of children globally

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Professor John Oxford, GHC Chair

## PAEDIATRIC GASTROINTESTINAL INFECTION INCLUDING DIARRHOEA

Diarrhoea is usually a symptom of an intestinal infection by bacteria, viruses or parasites. Infections are spread by consumption of contaminated food, drinking water or from person to person because of poor hygiene.

Newborn babies, infants and young children are more at risk from bacterial and viral infections than adults due to a number of contributory factors such as faster dehydration and developing immune systems.

“ Diarrhoeal diseases particularly in developing countries need urgent action. Almost one million babies die a year and although sanitation is still an issue in some countries, educating every community about hand hygiene is vital and something children can grasp even in the worst conditions, where it may well be life-saving. ”

Dr. Elizabeth Scott, GHC member

### DIARRHOEA AND PAEDIATRIC DEATH IN DEVELOPING COUNTRIES

- > More children die per day due to diarrhoea than from AIDS, malaria and measles combined<sup>8</sup>
- > 272 million school days are lost every year due to diarrhoea<sup>9</sup>
- > Diarrhoea alone kills 2,100 children worldwide each day<sup>10</sup>
- > Increased hygiene practices are a vital line of defence, thorough handwashing can reduce the risk of infection by 50%<sup>11</sup>
- > In children under 5 years old, it is estimated that 361,000 deaths from diarrhoea are entirely preventable if better hygiene practices are implemented<sup>5</sup>

A recent review of evidence linking interventions of the promotion of hand hygiene with soap and diarrhoea morbidity, showed up to a 40% reduction in diarrhoea.<sup>6</sup>

Food-related gastrointestinal infections still remain at unacceptable levels despite the fact that good kitchen hygiene, effective food storage and thorough cooking can help in their reduction.



> 125,000 Children under 5 die each year from food-related gastrointestinal infections<sup>12</sup>

> WHO estimate that 31% of reported foodborne outbreaks occur in private homes<sup>13</sup>

Food-related bacterial infections due to salmonella, *Escherichia coli* (*E.Coli*) and listeria occur either as a result of directly eating contaminated and poorly cooked food or, indirectly, by contact with contaminated surfaces, through the faecal-oral route or person-to-person transmission following inadequate hygiene practices such as not washing hands.

As well as teaching their children to wash their hands after using the bathroom, it is important for parents to practice effective hygiene precautions when it comes to preparing their child's food, such as thorough surface disinfection, helping to further reduce the risk of gastrointestinal infections.

GHC member Dr Nneoma Idika explains; *"Families can assist in the fight against infectious diseases by observing the following good domestic hygiene and infection control practices: sick children should be kept away from school so as to avoid transmitting the germs to others; children should be taught effective handwashing at critical times and also to sneeze or cough into tissue which should then be disposed of properly; surfaces that are touched often should be cleaned regularly with soap and disinfectant, adhering to instructions on their labels; sharing of personal items should be discouraged."*



Simple consistent messaging is key to educate the public properly about food hygiene and how to prevent gastrointestinal infections

Professor John Oxford,  
GHC Chair







IT IS PREDICTED THAT THE RISK OF RESPIRATORY INFECTION CAN BE REDUCED BY AS MUCH AS 16% SIMPLY THROUGH HANDWASHING WITH SOAP<sup>17</sup>



AS COLD AND FLU VIRUSES CAN SURVIVE ON SURFACES FOR UP TO 48 HOURS<sup>18</sup> AND CHILDREN CAN TOUCH SURFACES UP TO 300 TIMES IN 30 MINUTES,<sup>19</sup> SURFACE DISINFECTION IS A VITAL LINE OF PREVENTION.

## RESPIRATORY INFECTIONS INCLUDING COLDS AND FLU

While pneumonia represents a significant burden on the mortality of children, especially in developing countries, immunisation is the most effective way to prevent the infection.<sup>2</sup> Common infections such as colds and flu also have a major impact on families and children, in particular in terms of missed school days, as well as time taken off work by the parents to care for children.

- > 80% of upper respiratory tract infections are caused by viruses including influenza<sup>14</sup>
- > At least 2 million deaths every year can be attributed to acute respiratory tract infections<sup>14</sup>
- > In the US, the common cold alone accounts for approximately 22 million missed school days and 20 million absences from work, including time away from work caring for sick children<sup>15</sup>
- > It has recently been demonstrated that during influenza epidemics, healthy children less than 2 years of age have a significantly greater risk of hospitalisation for acute respiratory disease than older healthy children and a risk similar to that of children 5–15 years of age with high risk medical conditions<sup>16</sup>

Rhinovirus (the predominant cause of the common cold in older children and adults) causes infections all year round, with incidence peaking when children return to school. They then pass viruses on to their siblings in the home as a result of poor hygiene practices.

Several reports have shown that children are the major route in the transmission of influenza viruses to household contacts highlighting the need for good hygiene, along with routine flu immunisation, to limit respiratory infections including colds and influenza.

## IMPACT OF PAEDIATRIC INFECTIONS ON FAMILY LIFE AND SOCIETY

Research by the Global Hygiene Council found that more than 80% of children visited a healthcare professional due to a common infection.<sup>20</sup>

Respiratory and foodborne infections in particular, place a considerable burden on the prosperity of the global community as a result of absences from work and school with an average of 3.6 days off per household due to cold, flu or food poisoning.

*“Community-based pathogens that can survive on common touch surfaces include those that can cause gastrointestinal and respiratory infections. A greater understanding about the role of these common touch surfaces in infection transmission is vital to inform surface hygiene practices and help protect families’ health in the future”* explains Professor Elizabeth Scott.

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Handwashing using soap and clean running water, and cleaning and disinfection of hand and food contact surfaces are vital steps in protecting children from infection.

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Professor John Oxford, GHC Chair



# FACTORS AFFECTING THE SPREAD OF PAEDIATRIC INFECTIONS

Antibiotic resistance, misconceptions about infection transmission and complacency regarding home hygiene practices all threaten children's health around the world.

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Evolution of bacteria towards resistance to antimicrobial drugs is unavoidable and unstoppable, but much can be done to delay the spread of resistance. More research into the resistance of particular strains could allow a strong prediction about the mechanism that will be found later in bacteria pathogenic for humans and drugs could then be developed accordingly.

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Professor Patrice Courvalin, GHC member

## ANTIBIOTIC RESISTANCE—GLOBAL HEALTH AND ECONOMIC CRISIS

Overuse and misuse of antibiotics has resulted in the emergence and spread of antimicrobial resistant bacteria meaning a simple infection can now become a life-threatening condition. There has been a dramatic increase in multi-drug-resistant bacteria in the last few years with 700,000 people currently dying each year from resistant infections. This number is set to rise to ten million by 2050 if no action is taken.<sup>21</sup>

Not only does antimicrobial resistance threaten public health but it will also cripple economies with the financial cost of drug resistance estimated to add up to \$100 trillion by 2050.<sup>21</sup>

GHC member, Dr Nneoma Idika explains; *“Effective handwashing; keeping vaccinations up to date; and using antimicrobial drugs only when they are prescribed by a certified health professional, as well as finishing the course of treatment, are essential steps to prevent the emergence and spread of antimicrobial resistance.”*



INFECTION PREVENTION  
IS CURRENTLY BEING  
CHALLENGED, AS A RESULT  
OF MISCONCEPTIONS  
ABOUT THE BENEFITS OF  
BEING HYGIENIC



## MISCONCEPTIONS ABOUT ANTIBIOTIC USE TO TREAT PAEDIATRIC INFECTIONS

For much of the 20th century, antibiotics were the miracle cure-all that many relied on to battle bacteria-related infectious diseases. Today, there is widespread misunderstanding of antibiotics, their use and optimal prescribing practices for children.

Many healthcare professionals report that they are asked to prescribe antibiotics to treat viral infections such as the common cold and flu — escalating the problem of resistance in bacteria.

Many antibiotics are not available in paediatric dosages, leading to incorrect dosages for children. A study in 2015 showed that nearly half the children in the sample were treated with sub-optimal dosages of antibiotics, speeding up the development of drug resistance as it exposes the microbes to the drug without killing them, allowing them to develop resistance, multiply and spread.<sup>22</sup>

GHC member, Dr Nneoma Idika identifies; *“Improved detection of pathogens by simple and accurate diagnostics will help healthcare providers select the appropriate drug to treat any infection. This will minimise the broad spectrum antibiotic use that contributes to the development of resistance and antibiotic associated illness such as Clostridium difficile diarrhoea.”*

The GHC are calling for an increased awareness that better hygiene practices will help prevent the spread of infectious diseases, reducing the need for antibiotics, which are only effective against bacteria, and not viral infections.



## HOW THE HYGIENE HYPOTHESIS HAS CONTRIBUTED TO THE SPREAD OF INFECTIOUS DISEASES

The 'Hygiene Hypothesis' was first proposed by Strachan in 1989<sup>23</sup> and suggested that the recent rise in atopic (allergic) diseases, such as asthma and eczema, was caused by a lower incidence of infections in early childhood resulting from the trend towards smaller family size where unhygienic contact with older siblings was less.<sup>23</sup>

Since then, the idea that we have become too clean has been open to widespread misinterpretation. As a result, it is commonly believed by hygiene experts that people have become more relaxed and complacent about hygiene in recent years as they mistakenly believe that 'being too clean' is a root cause of the rise in allergies which undermines the importance of hygiene in controlling serious infectious diseases.

It is now widely recognised that the 'hygiene hypothesis' is no longer valid.

**According to GHC member Dr. Lisa Ackerley**

**“Hygiene is the crucial line of defence to reduce the incidence and spread of infections such as diarrhoea, colds, flu and pneumonia. In a world where more and more bacteria are becoming antibiotic resistant, prevention of illness becomes even more critical. However, infection prevention is currently being challenged, as a result of misconceptions about the benefits of being hygienic, as well as a lack of understanding about infection transmission.”**

There is a need to educate around the benefits of handwashing and targeted disinfection both in the home and in public places, alongside more education on how outdoor exposure, better ante-natal diet, breastfeeding and allowing children to play outside all help build a healthy balance of gut microbes to boost a child's immune system.

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# IMPACT OF HYGIENE PRACTICES ON PAEDIATRIC INFECTIONS



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Changing lifestyle factors can influence where and how preventable infections are contracted; for example, changes in environments and habits as well as a significant shift in how and where we eat, can all increase the transmission of infection causing bacteria. Antibiotic resistance also pushes prevention even higher up the agenda.

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Dr Lisa Ackerley, GHC member.



**OVER HALF OF FAMILIES (52%) DO NOT INCREASE SURFACE DISINFECTION AT HOME DURING THE COLD AND FLU SEASON<sup>9</sup>**



**CLOSE TO A FIFTH OF WORKING FAMILIES NEVER USE A DISINFECTANT PRODUCT, INCREASING THE RISK OF VIRUSES BEING LEFT ON SURFACES FREQUENTLY TOUCHED BY FAMILY MEMBERS<sup>9</sup>**



**ONLY 27% OF HOUSEHOLDS WITH CHILDREN STILL IN NAPPIES CLAIM TO CLEAN THE NAPPY CHANGING AREA MORE THAN ONCE A DAY<sup>9</sup>**

## LIFESTYLE FACTORS AND COMPLACENCY

Life for modern working families in the developed world is fast-paced and demanding. Lifestyles have changed considerably in the last 30 years and family life has also changed resulting in hygiene and hygienic food preparation often taking a back seat.

According to the Global Hygiene Council's Making Common Infections Uncommon survey, cleaning practices as well as handwashing, appear to be dangerously lacking, leaving families vulnerable to the risk of infectious illness.<sup>9</sup>

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# SMALL STEPS FOR BIG CHANGE

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Educating children and encouraging hygienic behaviour from a young age in both developed and developing countries is a fundamental step towards infection control not only for the immediate health benefit but because they will become hygiene ambassadors for their family and friends, helping to shape the hygiene culture and sense of responsibility in their community.

”

Dr. Lisa Ackerley, GHC member





## IMPROVED HYGIENE — THE KEY TO REDUCING THE INCIDENCE OF INFECTIONS IN CHILDREN

This report clearly demonstrates the high risks infections pose to the health and welfare of the world's families and children. We are living in an increasingly crowded and mobile world where new pathogens, including antibiotic resistant strains, are continually emerging and spreading more quickly and more easily than ever before. The GHC believe that prevention of infections through effective hygiene practices represents an important step in our day to day existence which could deliver big change in terms of the control and prevention of infectious diseases.

## REDUCING INFECTIONS IN DEVELOPING COUNTRIES

The GHC welcomes the work of Save The Children, WHO, UNICEF and the Public-Private Partnership for Handwashing (PPPHW) in improving access to sanitation and safe water in developing countries. Prevention and control of diarrhoea and pneumonia can only be tackled through integrated global and country specific programmes, whereby all those at risk receive interventions and education about the benefits of better hygiene, and hygiene practices improve as a result.

Tackling gender inequality and women's empowerment is associated with improvements in a variety of health and development outcomes. Evidence shows that education programmes can be one of the most effective agents in unlocking crucial behaviour change, with a mother's level of education having a significant and positive impact on child health outcomes.

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Group handwashing initiatives in schools enable children to become hygiene ambassadors in their own homes, teaching parents and siblings how to effectively wash their hands and prevent the spread of infectious diseases.

”

Dr. Elizabeth Scott, GHC member

“

The ability to reduce childhood mortality and morbidity related to infectious diseases is in our hands and handwashing has a major role to play.

”

Dr. Kgosi Letlape, GHC member

## STEPS TO IMPROVE HYGIENE AND REDUCE CHILDREN'S INFECTIONS IN THE DEVELOPED WORLD

By reducing the number of infections through good hygiene, the number of antibiotic courses prescribed can be lowered, which can in turn reduce the impact of antibiotic resistance.

Furthermore, as Dr. Elizabeth Scott explains; *“Children and their families need to take personal responsibility for improved hygiene practices in their homes and immediate environment. We need to get back to basics and teach children in schools about bacteria, on commonly touched surfaces, and the effectiveness of handwashing and hygiene techniques, to develop a healthy and responsible approach to infection prevention. Once adequate, basic techniques have become routine, they will be kept for a lifetime, and we hope they will be passed from generation to generation.”*

## MATERNAL EMPOWERMENT TO REDUCE NEONATAL INFECTIONS

Nearly half (46%) of childhood deaths (under the age of 5) take place during the neonatal period (the first 28 days of life).<sup>24</sup> These deaths are mainly caused by pre-term birth, intrapartum-related complications and infections.<sup>25</sup> From the end of the neonatal period and through the first 5 years of life, the main causes of death are pneumonia, diarrhoea and also malaria.<sup>24</sup>

Maternal education has been found to play an important role in reducing child mortality and improving health in developing countries<sup>26</sup> as educated mothers have better knowledge about health care, nutrition and can provide healthy sanitary habits for their children.<sup>27</sup>

According to GHC member, Professor Gary Darmstadt, "Gender inequality can significantly impact on the health of women and their families and a failure to address this issue may limit the impact of health interventions"



**2.7  
MILLION**

BABIES DIE  
WITHIN THE  
FIRST MONTH  
OF LIFE<sup>24</sup>



**46%**  
OF ALL UNDER-  
FIVE DEATHS  
ARE WITHIN  
THE FIRST 28  
DAYS OF LIFE<sup>24</sup>



**5.9  
MILLION**  
CHILDREN  
UNDER FIVE DIE  
FROM MOSTLY  
PREVENTABLE  
CAUSES, EQUAL  
TO NEARLY 17,000  
CHILD DEATHS  
EACH DAY<sup>28</sup>



NEWBORN  
AND YOUNG  
BABIES ARE  
PARTICULARLY  
SUSCEPTIBLE  
TO GASTROIN-  
TESTINAL  
INFECTIONS AND  
PNEUMONIA<sup>29</sup>

“

Empowering young women in developing countries through health and hygiene education, improving their awareness of prevention strategies, will ultimately prevent vulnerable newborns picking up infections and dying

”

Professor Gary Darmstadt,  
GHC member

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# 5 STEP PLAN

To reduce the incidence and burden of common infections, including cold, flu, diarrhoea, pneumonia and gastro-intestinal infections, the Global Hygiene Council has identified five areas where small changes in children's and family hygiene practices could have a big impact on protecting children's health:

“Improving access to clean water and sanitation as well as achieving gender equality and access to education are critical to improving and protecting children's health and need to be tackled on a global scale. However, hygiene is effectively a first line of defense and adopting better hygiene practices could have a dramatic and positive impact on the welfare of young children.”

Professor John Oxford, GHC Chair



**2.7 MILLION**  
BABIES DIE WITHIN  
THE FIRST MONTH  
OF LIFE<sup>24</sup>



**Protect** babies when they are at their most vulnerable, in the first few weeks of life before their vaccination schedule starts<sup>30</sup>



Minimise the risk of illness by reducing the number of infectious diseases in babies



**EVERY MINUTE**  
A CHILD UNDER 5 DIES  
FROM DIARRHOEA<sup>31</sup>



**Prevent** the spread of infections through improved hand hygiene



The incidence of diarrhoea could be halved through effective handwashing alone<sup>31</sup>

3

**!** FACT

**220 MILLION**  
CHILDREN FALL ILL  
FROM FOODBORNE  
DIARRHOEAL DISEASES  
EACH YEAR<sup>32</sup>

**!** SMALL STEP

**Minimise** the risk of bacteria contaminated foods being consumed

**↔** BIG CHANGE

A reduction in the number of children contracting bacterial gastroenteritis or food poisoning

4

**!** FACT

COLD AND FLU VIRUSES  
CAN SURVIVE ON  
SURFACES FOR UP TO  
**48 HOURS**<sup>18</sup>

**!** SMALL STEP

**Stop** the spread of infection causing germs in the home and wider communities

**↔** BIG CHANGE

A reduction in the incidence and burden on families and communities of some of the most common children's infections such as colds and the flu

5

**!** FACT

**10 MILLION**  
DEATHS A YEAR ARE  
PREDICTED BY 2050  
DUE TO ANTIBIOTIC  
RESISTANCE<sup>21</sup>

**!** SMALL STEP

**Break** the chain of transmission and stop children becoming unwell

**↔** BIG CHANGE

A reduction in the number of children contracting infections and being prescribed antibiotics

## REPORT CONTRIBUTORS



### **Professor John Oxford**

Chair of the Global Hygiene Council. John Oxford is the UK's top expert on influenza and Emeritus Professor of Virology at the University of London



### **Dr Lisa Ackerley**

A Chartered Environmental Health Practitioner for over 25 years and Professorial Fellow of the Royal Society of Public Health and Visiting Professor of Environmental Health, University of Salford.



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### **Professor Gary Darmstadt**

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### **Dr Nneoma Idika**

Retired as Deputy Director of Research at the Nigerian Institute of Medical Research, Yaba, Lagos with special interest in reducing Diarrhoeal and Respiratory Infections in children. Currently an independent consultant in hygiene practices and infectious diseases



### **Dr Kgosi Letlape**

Former Chairman of the South African Medical Association (SAMA) and a past president of the World Medical Association (WMA)



### **Professor Elizabeth Scott**

Chair of the Department of Public Health and Co-director of the Simmons Center for Hygiene and Health in Home and Community. An expert on issues associated with the transmission of microbial pathogens in the indoor environment



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[hygienecouncil.org](http://hygienecouncil.org)