

Targeted Hygiene

Applications to break the chain of infection

Dr Lisa Ackerley
International Scientific Forum on Home Hygiene

Hosted by Martin Kiernan
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www.webbertraining.com February 8, 2024

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BACKGROUND

Experience and qualifications

- Chartered Environmental Health Practitioner
- Local government
- Central government
- Academia 30 years as an independent hygiene consultant, expert witness, media adviser and adviser for food safety to UK Hospitality
- PhD behavioural science



Positions

- Industry Trustee, International Scientific Forum on Home Hygiene
- Director, Public Health and Hygiene Engagement, Reckitt
- Chair of Board, Reckitt Global Hygiene Institute
- Chair of the Technical Advisory Board at Food Alert



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Learning Objectives

After participating in this session, attendees should be able to:

- differentiate between the efficacy of indiscriminate use of disinfectants (hygiene theatre) and the targeted hygiene approach.
- use a risk assessment process to apply targeted hygiene principles to determine levels of hygiene interventions in large scale commercial settings.
- give examples of how behaviour change theory could be used to improve uptake of hand hygiene in large scale events.

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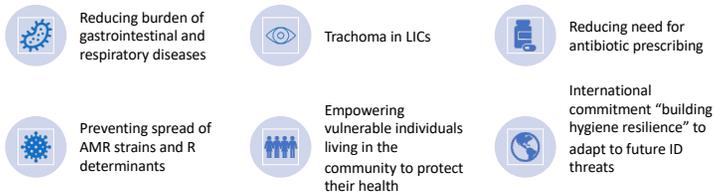
Overview



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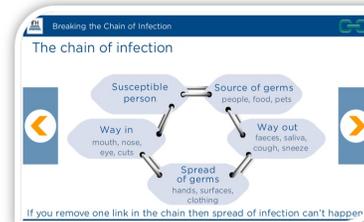
Developing hygiene behaviour for C21st needs

We need a comprehensive/holistic approach to hygiene which addresses all hygiene related disease issues - together



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The journey of the germ

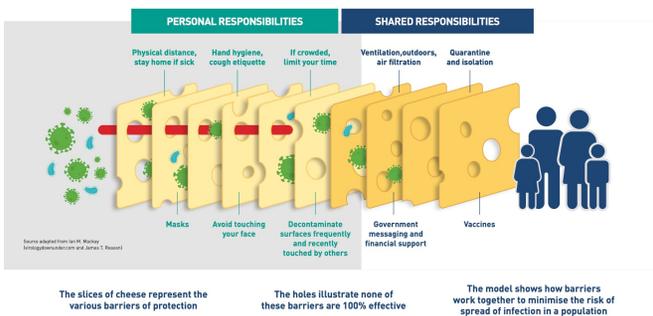


https://www.ifh-homehygiene.org/e_learning/breaking_the_chain/story_html5.html

© IFH

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The Swiss Cheese Model: breaking the chain of infection



The slices of cheese represent the various barriers of protection

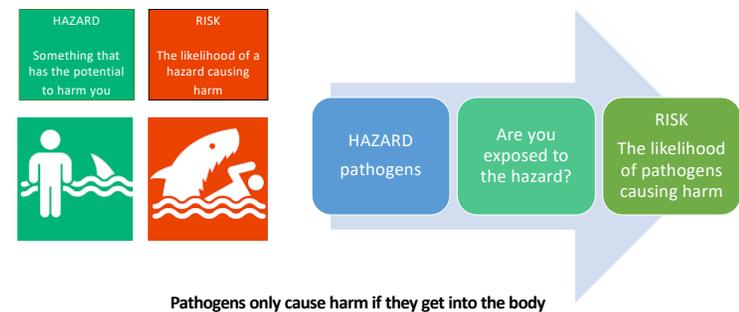
The holes illustrate none of these barriers are 100% effective

The model shows how barriers work together to minimise the risk of spread of infection in a population

Adapted from McKay by © IFH 2022

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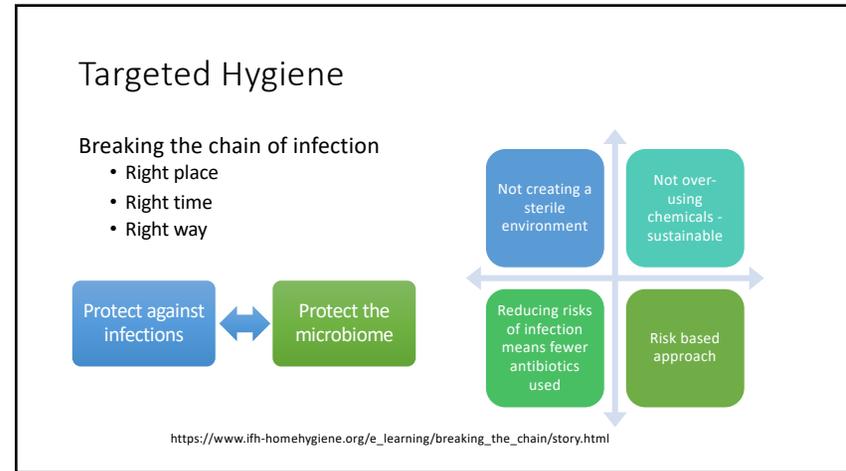
Hazard and risk: fundamental distinctions



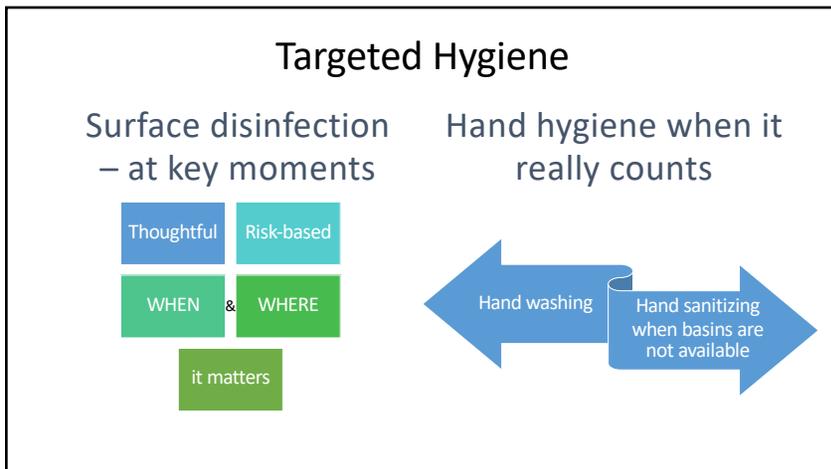
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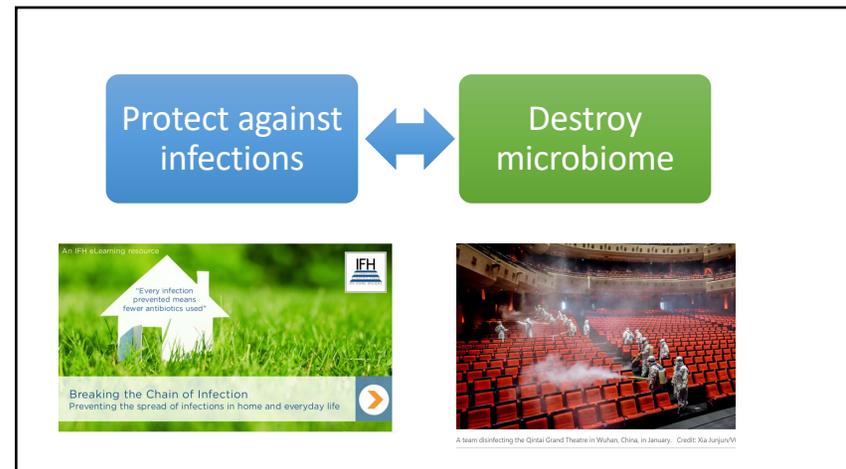
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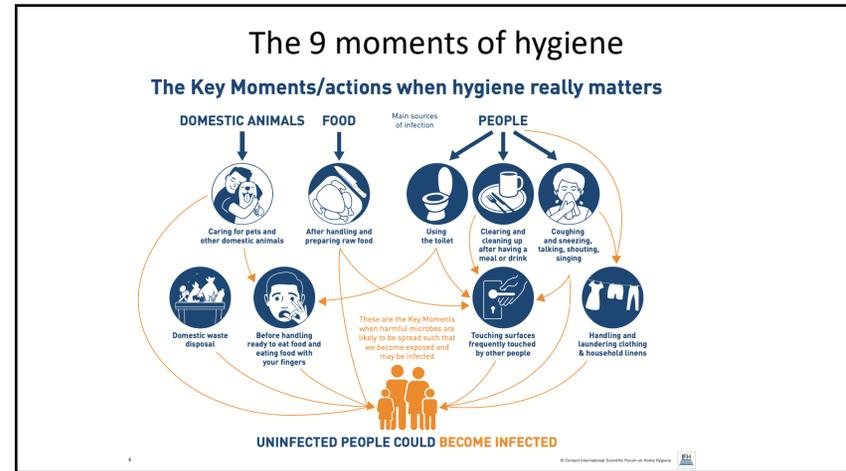


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Putting Targeted Hygiene into practice – WHEN, WHERE and HOW

<https://www.ifh-homehygiene.org/sites/default/files/publications/Breaking%20the%20chain%20of%20infection.pdf>

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Where to practise hygiene at each of the Key Moments

CONTROL POINTS FOR ACTION	Coughing and sneezing, talking, shouting, singing	Using the toilet	After handling and preparing raw food	Before handling ready to eat food and eating food with your fingers	Clearing and cleaning up after having a meal or drink	Touching surfaces frequently touched by other people	Handling and laundering clothing & household linens	Caring for pets and other domestic animals	Domestic waste disposal
Hand hygiene	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hand contact surface hygiene	✓	✓	✓			✓	✓	✓	✓
Food contact surface hygiene			✓	✓					
Cooking, eating and drinking utensils			✓	✓	✓			✓	
Cleaning equipment hygiene	✓	✓	✓	✓	✓	✓		✓	✓
Laundry hygiene							✓	✓	
Air hygiene	✓								
Social distancing	✓								
Mask wearing	✓								
Ventilation	✓								
Others		✓							
Cleaning the toilet		✓							

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Hygiene Advice – is it meaningful?

GOV.UK

Home > Coronavirus (COVID-19)

Guidance

Living safely with respiratory infections, including COVID-19

Guidance for living safely with respiratory infections, including coronavirus (COVID-19).

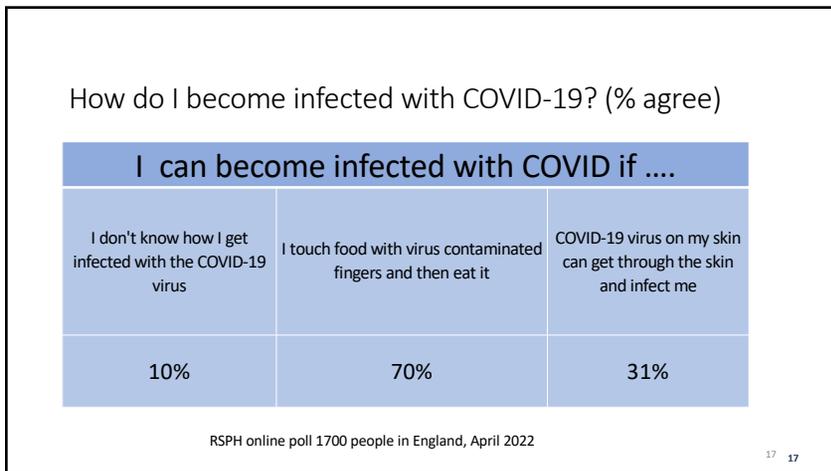
<https://www.gov.uk/guidance/living-safely-with-respiratory-infections-including-covid-19>

3. Remember the basics of good hygiene

Following these basic rules of good hygiene will help to protect you and others from COVID-19 as well as many other common infections:

- cover your nose and mouth when you cough and sneeze
- wash your hands
- clean your surroundings

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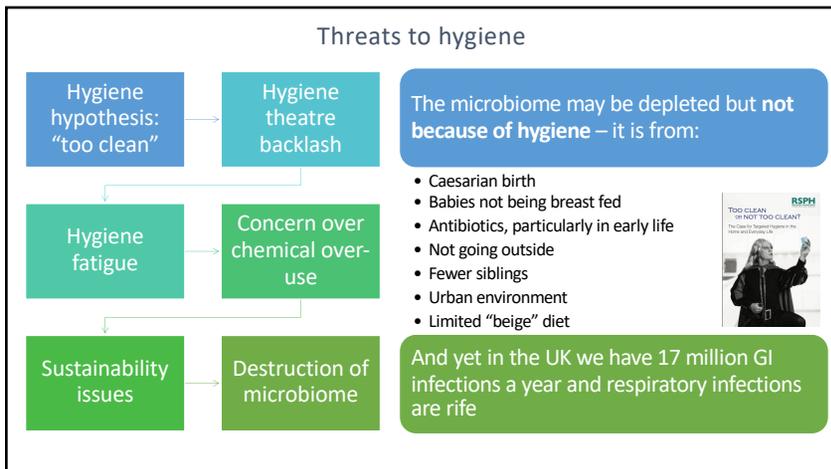


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Targeted Hand washing

- Why should it be done?
- What is "regularly"?
- When should it be done?
- What if you can't wash your hands?
- Is a single message sufficient or does it need qualification – then is it too complicated?

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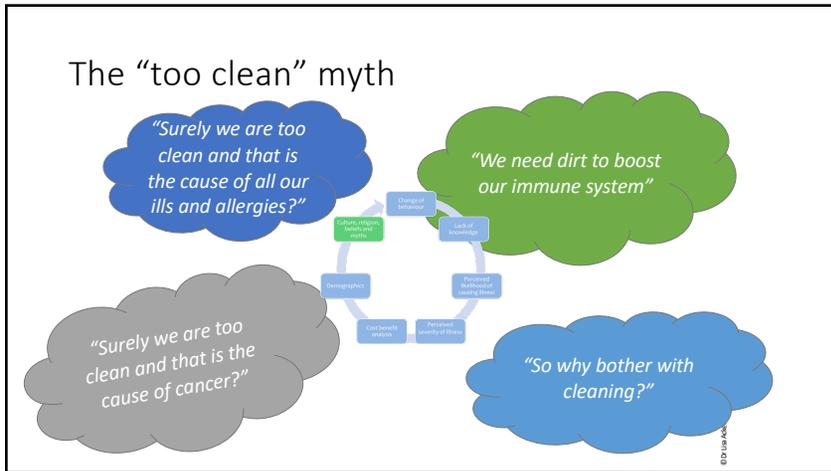
The Hygiene Hypothesis

- David Strachan's paper in 1989 blamed rising allergic diseases as caused by lower incidence of infection in early childhood
- Underlying cause could be "improved household amenities and higher standards of personal cleanliness"
- The Hygiene Hypothesis was born:
- "we are too clean for our own good"

Strachan DP. Hay fever, hygiene, and household size. *BMJ* 1989;299:1259-1260

Consequences!

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Being a clean freak increases your risk of illness, allergy expert claims

By DAILY MAIL REPORTER
UPDATED: 14:41, 14 April 2010

Excessive cleanliness which creates a sterile environment has led to soaring rise in allergies, a new report has shown. Allergies have become widespread in developed countries - with hay fever, eczema, hives and asthma increasingly prevalent.

According to Dr Guy Delespasse, director of the Laboratory for Allergy Research at the University of Montreal, the hike in allergies is due to our obsession with cleanliness.

How keeping children too clean can wreck their immune systems

• Children with pets or who grow up on farms are less likely to have allergies

• Asthma, eczema, hay fever and diabetes being fuelled by indoor lifestyles

By FIONA MACRAE FOR THE DAILY MAIL
PUBLISHED: 18:27, 22 March 2012 | UPDATED: 18:27, 22 March 2012

Today's children may be too clean for their own good, research suggests.

Evidence is growing that dirt and germs can protect against disease - and that our indoor-based, ultra-clean lifestyles are

Expert opinions in the media

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MailOnline

Leukaemia may be triggered by keeping babies too clean as expert claims cases could be prevented by exposing children to germs

- Genetically at-risk youngsters may develop leukaemia if not exposed to germs
- At-risk mice in germ-free environments developed the condition when exposed
- Toddlers who attend nursery are 30% less likely to suffer from leukaemia
- Researcher claims findings suggest most childhood leukaemia is preventable
- Childhood leukaemia is particularly common in affluent societies

MailOnline

Do YOU hate cleaning? Here's a good excuse to avoid it: Chemicals in household products 'increase the risk of lung damage'

- The Norwegian study looked at 5,000 women over a 20 year period
- Found occupational cleaners had 17% reduced lung function than average
- But women only using products at home also had 14% function decline
- Campaigners Healthy Lung for Life recommends wipes instead of sprays

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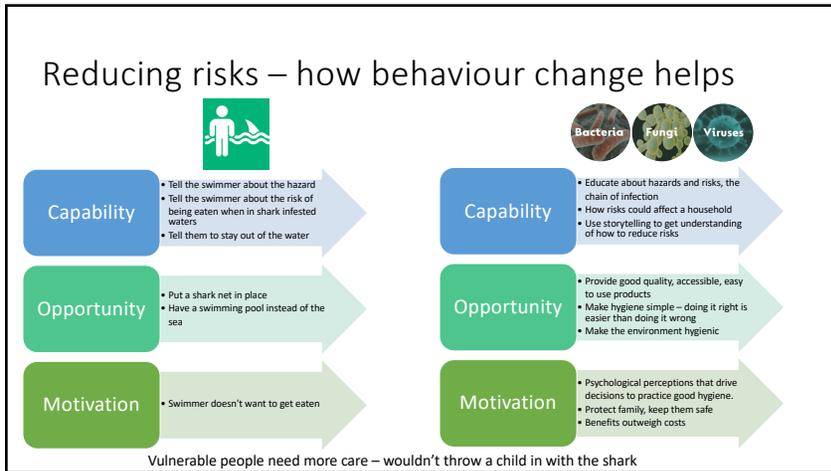
The Sun TV & SHOWBIZ | NEWS | FABULOUS | MONEY | MOTORS | TRAVEL | TEC

ATTACK OF THE HANDBUGS

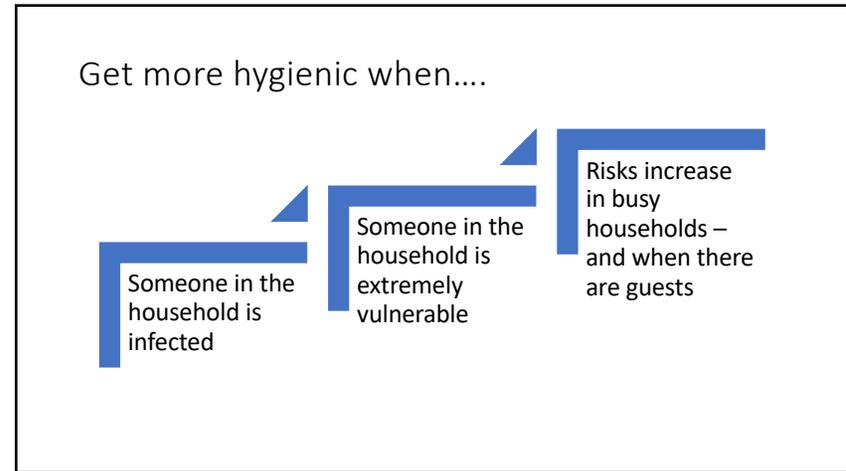
Handbags named as one of the eight germ hotspots in YOUR home — as we reveal worst offenders from sponges to remotes and toothbrushes

Along with handbags, toothbrushes, remote controls and pet beds are named in a list of the eight 'germiest' hotspots in a typical household.

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Targeted hygiene for public settings

What can businesses do to implement the principles of Targeted Hygiene?

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Commercial premises

- Same principles of Targeted Hygiene apply
- Keep applying the principles ESPECIALLY when other measures are not being used (Swiss cheese)
- Use behavioural theory to enhance public engagement – this is a partnership!
- It is a risk-based approach

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Targeted Hygiene at Large Scale Events

Birmingham 2022

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- Asked by the UK Cabinet Office to be the hygiene partner for COP26
- Our task was to design and implement hygiene interventions to prevent the spread of COVID-19
- As an Environmental Health Practitioner, I worked with the team to provide the public health input using a risk management approach and applying targeted hygiene principles.

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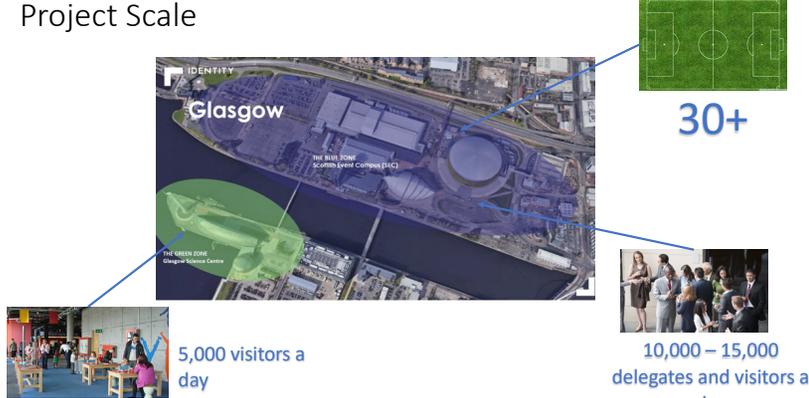
- Our scope during COP26
- Blue zone delegate areas
- Blue zone crew areas
- Green zone delegate areas
- Green zone crew areas
- Crowne plaza reception and meeting space
- Radisson red reception and event space
- Disinfection and hygiene interventions



“
Good hygiene practices are the foundation of health and I am delighted to welcome Reckitt as Hygiene Partner for COP26
”
Alok Sharma, COP26 President

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Project Scale



30+

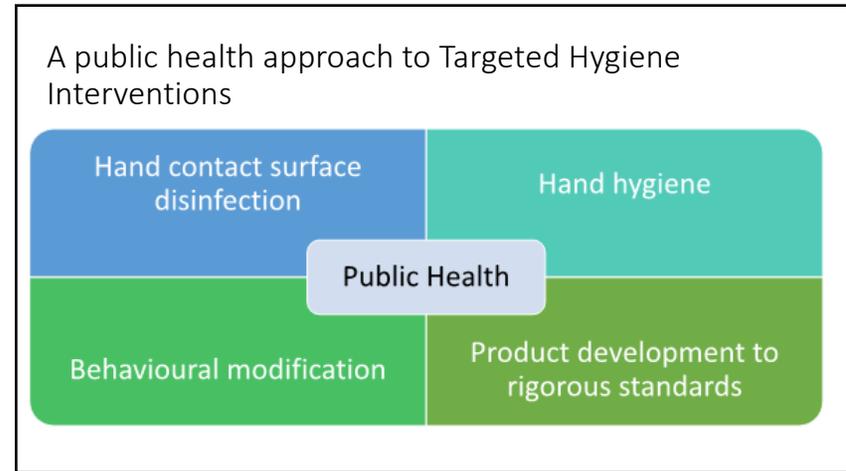
5,000 visitors a day

10,000 – 15,000 delegates and visitors a day

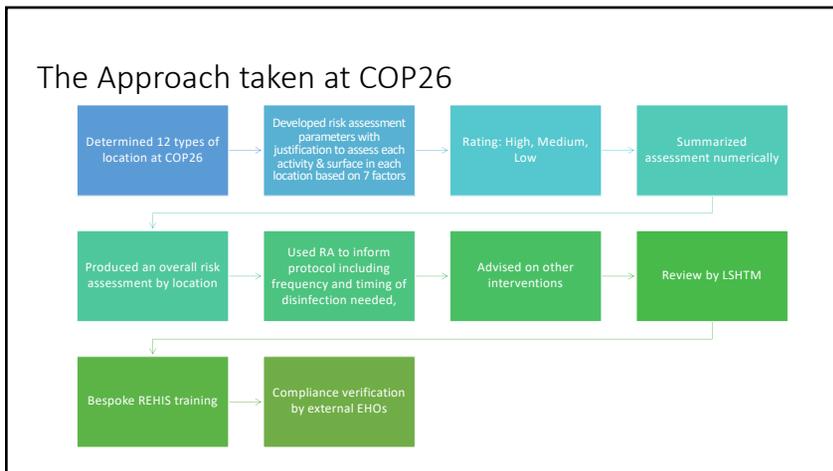
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A RISK BASED, TARGETED HYGIENE APPROACH

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- ## Developed Risk Rating Template based on evidence-based parameters
- | Risks | |
|-------|--|
| 1 | Density of occupation and distancing |
| 2 | Activity in space |
| 3 | Likelihood of people touching surfaces |
| 4 | Times when spaces and surfaces can be cleaned (ie when not occupied) |
| 5 | Do people stay at one space for the duration or do they hot desk? |
| 6 | Are people encouraged to touch exhibits? |
| 7 | Do people eat or drink? Finger food? |

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Applied Risk Rating to each surface or activity in locations

- Considered parameters
- Referred to scientific evidence
- Made a judgement of level of risk

Example	Risk Rating	Numerical 1-3	Justification	Evidence
Security trays	H	3	Every tray touched by user and handler, reused frequently	https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-018-3150-5

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Determined Overall Risk Rating by Location

Item risk rating	Numerical value per item	Overall score / number of categories	Overall category risk rating
High (Red)	3	≥ 2.5	High
Medium (Amber)	2	$1.5 < 2.5$	Medium
Low (Green)	1	< 1.5	Low

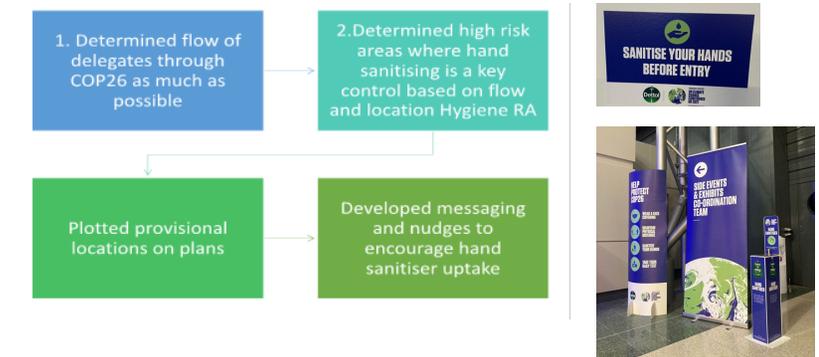
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CRITICAL TIMES FOR HAND WASHING OR HAND SANITIZING INCLUDE

- ✓ On entry to the conference
- ✓ On entry to a new area in the conference
- ✓ Before putting on a face covering, or before removing it
- ✓ After handling or touching any surfaces that may have been touched by others (pens, security trays, bannisters, lift buttons, etc.)
- ✓ Before sitting at a desk or space (when touching the face is more likely)
- ✓ Before eating with fingers
- ✓ After using the toilet
- ✓ Before touching the face

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Sanitising stations – how to encourage usage



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Hygiene Kits: personal responsibility

- Messaging
- Face covering
- Personal hand sanitizer
- Personal pack of wipes



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Training

- Liaised with Royal Environmental Health Institute of Scotland (REHIS)
- Trainer carried out a bespoke version of REHIS Elementary Cleaning and Disinfection course
- Developed cascade materials
- Cleaning staff trained on using ATP machines to check cleaning standards.

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Compliance

- ✓ To check and demonstrate that our protocols were being applied effectively
- ✚ Three Environmental Health Officers were recruited via REHIS
- 📄 Responsibilities to check compliance through sampling and observations.
- 👁️ The Reckitt team made observations

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EHO ATP testing – cloud based Hygiena Ensure

- Determined sampling plan based on high frequency touch points
- Tested immediately after disinfection to check compliance
- Cloud based, real time results
- Coaching if results unsatisfactory, re-test
- Provided a daily dashboard to HMG
- Enhanced confidence and trust with officials



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50,000 touch points
15 protocols
30,000 hygiene kits

- 12 key areas
- Identified high touch areas
- Risk assessed; to inform protocol including frequency and timing of disinfection needed, advised on other interventions



Supplying Products to COP26

- 6699L of Hand Sanitizer
- 1188L of Hand Wash
- 9126L of Anti-bac spray
- 3168 Packs of Biodegradable Wipes

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- 2 in every 1000 people officially affiliated with COP26 tested positive
- 11 in every 1000 people in the Scottish population were infected with COVID-19

<https://www.publichealthscotland.scot/publications/surveillance-of-the-impact-of-cop26-on-covid-19-infections-in-scotland/surveillance-of-the-impact-of-cop26-on-covid-19-infections-in-scotland-final-report-14-december-2021/>

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Berlin Public Health Conference 2022 Poster

Promoting the key moments of hand hygiene in a Targeted Hygiene intervention at COP26

Lisa Ackerley, Carolyn Buckley, Adrian Paskey, Stephanie Cooper, Katy Slater & Stuart Bainbridge
Medical Sciences – Germ Protection & New Growth Platforms, Rocket

BACKGROUND	RESULTS	DISCUSSION
<p>The UN Climate Change Conference (COP26) in Glasgow, November 2021, presented a unique public health challenge in the midst of the COVID-19 pandemic. With 34,672 delegates attending over 13 days, this international event posed a risk for SARS-CoV-2 infection. As a hygiene partner of COP26, Rocket developed and delivered a risk-based approach, rooted in the principles of Targeted Hygiene and behavioural science, that aimed to reduce SARS-CoV-2 transmission at the event. Targeted Hygiene focuses on hygiene interventions at the highest risk moments where they have the greatest potential to disrupt the chain of infection (Bainbridge, 2022). Compliance of COP26 delegates with hand hygiene interventions was an essential component of this approach.</p>	<p>Risk assessment: The risk assessment process considered delegate activities and movement throughout COP26, versus its dispersion, risk-rating, for locations, surfaces and activities, based on scientific literature and Targeted Hygiene Theory. This included 7,737 chairs, 586 elevator buttons, 6,000 door handles, 755 toilets, 880 laptop microphones, and 40 "high risk hotspots". Infection rate: Over 14,000 attendees were recorded in the main delegate zone of the conference for most days of the event. The incidence of COVID-19 infection in the delegate population of COP26, was confirmed to be lower than that of the surrounding population at the time (2 in 1,000 vs. 11-12 in 1,000 people respectively) (Bain, 2021).</p>	<p>Delegates were encouraged by hygiene messaging to take personal responsibility for hygiene behaviours at COP26, supported by the opportunity to practice hand hygiene at key moments using effective products. The integration of behavioural science principles – primarily "capability", "motivation" and "opportunity" – in our Targeted Hygiene approach is considered a key driver of compliance at COP26. This approach provided not only an effective means of reducing SARS-CoV-2 transmission, but the opportunity to use products in a considerate and sustainable manner.</p>



Figure 1. Determ™ hand hygiene interventions at COP26: (A) hand sanitizer station, (B) liquid hand wash, (C) antibac mist station, (D) hygiene service counter, (E) delegate hygiene kit box, and (F) handwashing demonstration with Determ™ reactive liquid dispensing barrier.

METHODS	CONCLUSION
<p>Rocket was tasked with designing and executing hygiene interventions for this mass gathering. For hand hygiene, this involved four key aspects:</p> <ol style="list-style-type: none"> assessment of the risk of SARS-CoV-2 transmission at defined locations throughout COP26 venues, focusing on high touch points and hand-to-face contact activities; development of hand hygiene interventions based on Targeted Hygiene principles and the findings of the risk assessment; provision (and optimum placement) of hand hygiene products to be used by delegates (Figures 1 A-F), near included over 700 hand sanitizer stations throughout COP26 venues, liquid hand wash at sinks, and a gift box for each delegate containing a face covering, reliable hand sanitizer and face disinfectant wipes; hygiene messaging to inform, educate and motivate delegates (Figures 1 D-F); this was provided throughout COP26 venues and on delegate gift boxes. <p>Methodology to measure delegate compliance with hand hygiene interventions was developed based on the "COM-B" behaviour change model (Figures 2) (Michie et al., 2011).</p>	<p>Although no single intervention can be attributed to the avoidance of an outbreak, this Targeted Hygiene approach is considered to have contributed to the reduced incidence of COVID-19 infection at COP26, by helping to break the chain of infection.</p> <p>This risk-based approach to hand hygiene serves as a blueprint for effective and sustainable non-pharmaceutical interventions at large scale events such as COP26.</p>

Figure 3. How the COM-B behaviour change model was applied to encourage hand hygiene behaviour at COP26

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Commonwealth Games Birmingham 2022

- Targeted Hygiene Approach adopted as for COP26
- Messages aligned to the event
- Stickers on the back of doors in toilet cubicles
- Hand sanitizer dispensers that talk to people and measure use on a display
- Placement of dispensers to interrupt and encourage



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PROVING TARGETED HYGIENE WORKS

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Quantitative Microbial Risk Assessment (QMRA) studies: determine the risk of illness

The QMRA framework uses mathematical models and quantitative data to examine the exposure probability, characterize the spread of pathogenic agents, and assess the infection risk from such exposure.

Output = overall infection risk in a specific scenario

The QMRA framework uses mathematical calculations to look at real-world risk outcomes.

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QMRA Modelling

What's the risk of getting ill from an infectious disease?

What's the reduction of risk of getting ill from an infectious disease?

- If you don't practise hygiene?
- If you apply targeted hygiene?

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Who touched that? Interconnection of high-touch surfaces drives pathogen spread in public spaces

Lisa Achenley, Stephanie Cooper, Sophie E. Upton, Ashim Paudyal, Lucas Gert, Carolyn Buckley, Mary E. Spitzer, Jonathan D. Sontag, Jack L. Paster, & Kelly A. Reynolds

1. Medical Sciences - Germ Protection & New Growth Platform, BGSU
2. Community, Environment, and Policy, College of Public Health, University of Arizona

Dublin European Public Health Conference 2023

BACKGROUND

Surface contamination on touch plays an important role in pathogen spread in public spaces (Diaz et al., 2013), particularly in areas where numerous people may pass through the space and interact with shared surfaces and objects. This has the ability to identify the most common, frequently touched surfaces, measure hand interactions, and evaluate the spread of a carriage when a person touches.

METHODS

In a working hotel lobby (Figure 1), observation (30 hours) was performed in order to identify the surfaces and objects touched by lobby users. The sequence of touches performed by each individual was recorded from which surface-to-surface interactions were calculated.

RESULTS

A total of 324 individuals performed 427 touches over 13 different surfaces in the hotel lobby, more than half of the individuals (50%) touched 2 or more surfaces (Figure 2).

The elevator button and front desk counter were the most frequently touched (24 and 23% of all touches, respectively), with 55% of individuals touching the elevator button, and 70% touching other counter, or both.

CONCLUSIONS

Surfaces in the hotel lobby were frequently touched and highly interconnected, resulting in extensive spread of surface contamination in a hotel lobby. Commonly touched features, such as elevator buttons, are key drivers of interconnection and thus potential pathogen spread. This data demonstrates the importance of hands in distributing contamination between shared surfaces and highlights the need for hand and surface hygiene interventions to disrupt the process of the germ in public settings.

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RPSH / IFH: Embedding Targeted Hygiene for Health Resilience

Practising good hygiene starts at home

On average, we spend over a third of our lives at home.¹ Hygiene behaviours, especially those relating to hand, food, toilet, respiratory, laundry and pet hygiene have a huge bearing on overall population health. The Covid-19 pandemic also showed us the importance of practicing good hygiene within our shared use of public spaces (including schools, workplaces, supermarkets, public transport, leisure settings etc). When re-opening after lockdown restrictions, facilities had to implement strategies to make them "COVID secure", but this fundamentally depended on whether the public using these facilities practiced effective hygiene behaviours.^{2,3}

It's time to clean up our act on home hygiene: Embedding Targeted Hygiene for health resilience

Download the report: It's time to clean up our act on home hygiene: Embedding Targeted Hygiene for health resilience

<https://www.rsph.org.uk/our-work/policy/infection-control/its-time-to-clean-up-our-act-on-home-hygiene-embedding-targeted-hygiene-for-health-resilience.html>

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Public Health in Practice
Volume 5, June 2023, 100362

Developing resilience against the threat of infectious diseases and anti-microbial resistance: Putting targeted hygiene into practice in home and everyday lives

Sally F. Bloomfield^{a, b}, Lisa M. Ackerley^{a, b, c}

<https://doi.org/10.1016/j.pubhip.2023.100362>

<https://www.sciencedirect.com/science/article/pii/S2666535223000083?via%3Dihub>

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IFH

Thank you!

<https://www.ifh-homehygiene.org>

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www.webbertraining.com/schedulep1.php	
	<i>(Australasian Teleclass)</i>
February 14, 2024	HUMAN AMR SURVEILLANCE – WHERE ARE WE NOW AND WHERE SHOULD WE BE HEADING? Speaker: Dr. Paul Turner , Cambodia Oxford Medical Research Unit, Angkor Hospital for Children, Cambodia
	<i>(European Teleclass)</i>
February 27, 2024	A DRIVE TO SURVIVE: COVID-19 IMPLICATIONS FOR SYSTEMIC RESILIENCE ON ETHICS, DATA SCIENCE AND RISK-MANAGEMENT Speaker: Prof. Andro Košec , University of Zagreb, Croatia
February 29, 2024	INFECTION PREVENTION THROUGH THE LENS OF IMPLEMENTATION SCIENCE Speaker: Dr. Mireille Dekke , Amsterdam University Medical Center, Netherlands
	<i>(FREE Teleclass ... Denver Russell Memorial Teleclass Lecture)</i>
March 5, 2024	WATER AS A RISK OF HEALTHCARE-ASSOCIATED INFECTION Speaker: Prof. Jon Otter , Imperial College London
	<i>(FREE Teleclass)</i>

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