Research priorities to strengthen environmental cleaning in healthcare facilities

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London School of Hygiene and Tropical Medicine

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October 28, 2025

An invisible workforce: the neglected role of cleaners in patient safety on maternity units

Suzanne Cross, Giorgia Gon, Emma Morrison, Koasar Afsana, Said M. Ali, Tina Manjang, ...show all

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Cite this article https://doi.org/10.1080/16549716.2018.1480085 Check for updates

Key milestones

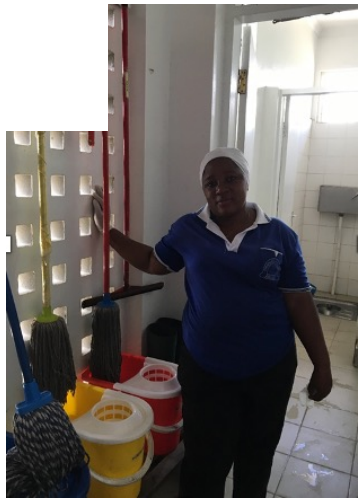
2013 – 2015
WASH & CLEAN assessments:
India, Bangladesh, Zanzibar, Ethiopia

Hygiene on maternity units: lessons from a needs assessment in Bangladesh and India

Suzanne Cross [1], Kaosar Afsana [2], Morsheda Banu [3], Dileep Mavalankar [4], Emma Morrison [5], Atiya Rahman [3], Tapash Roy [6], Deepak Saxena [4], Kranti Vora [4], Wendy J Graham [7]

Unpacking the enabling factors for hand, cord and birth-surface hygiene in Zanzibar maternity units

Giorgia Gon [1 2], Said M Ali [3], Catriona Towriss [4], Catherine Kahabuka [5], Ali O Ali [6], Sue Cavill [7], Mohammed Dahoma [6], Sally Faulkner [8], Haji S Haji [3], Ibrahim Kabole [9], Emma Morrison [2], Rukaiya M Said [6], Amour Tajo [3], Yael Velleman [10], Susannah L Woodd [1 2], And Wendy J Graham [1 2]



Key milestones for training development

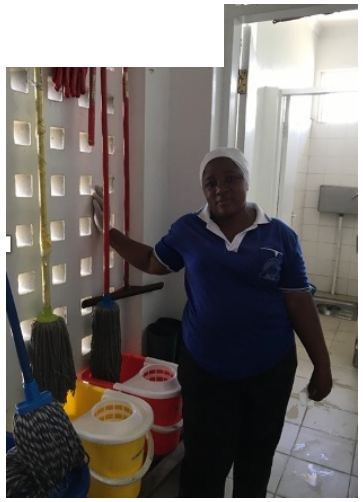
2013 – 2015
WASH & CLEAN assessments:
India, Bangladesh, Zanzibar, Ethiopia

2015–
TEACH
and pi
Gamb
Myani

Research | Open access | Published: 07 January 2021

The Clean pilot study: evaluation of an environmental hygiene intervention bundle in three Tanzanian hospitals

Giorgia Gon, Abdunoor M. Kabanywanyi, Petri Blinkhoff, Simon Cousens, Stephanie J. Dancer, Wendy J. Graham, Joseph Hokororo, Fatuma Manzi, Tanya Marchant, Dickson Mkoka, Emma Morrison, Sarah Mswata, Shefali Oza, Loveday Penn-Kekana, Yovitha Sedekia, Sandra Virgo, Susannah Woodd & Alexander M. Aiken



Key milestones

2013 – 2015
WASH & CLEAN assessments:
India, Bangladesh, Zanzibar, Ethiopia

2015– 20
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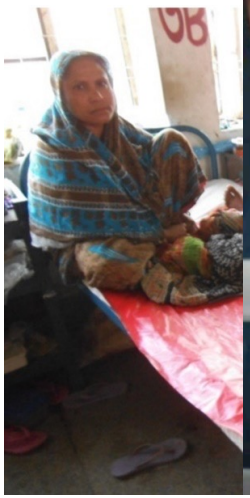
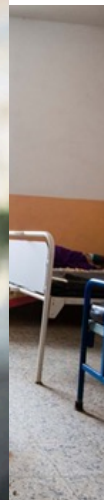
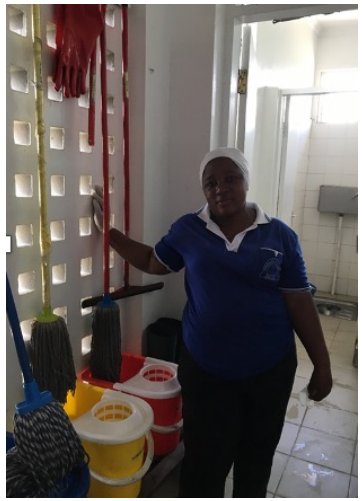






Key milestones

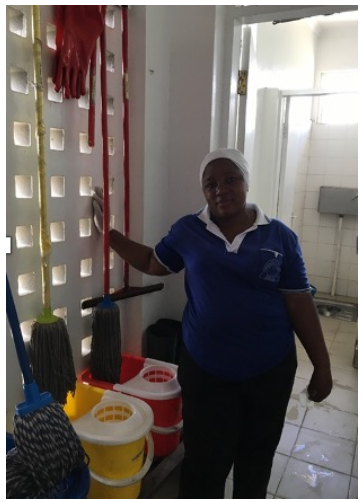
2013 – 2015
WASH & CLEAN assessments:
India, Bangladesh, Zanzibar, Ethiopia

2015– 2017
TEACH CLEAN development and piloting:
Gambia, India, Myanmar

2018 – 2019
TEACH CLEAN before and after design:
Tanzania

2019-2021
JMP global monitoring

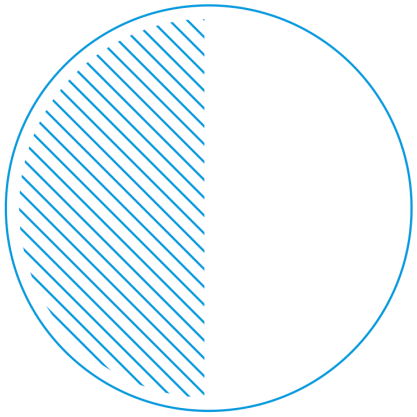
2022 – 2024
WHO adaptation
- Official training for LMICs



WHO adaptation

Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries

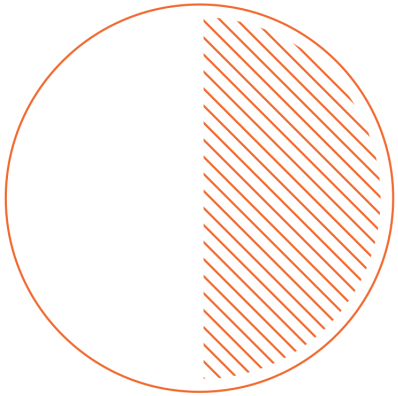
Trainer's guide



World Health Organization

Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries

Modules and resources



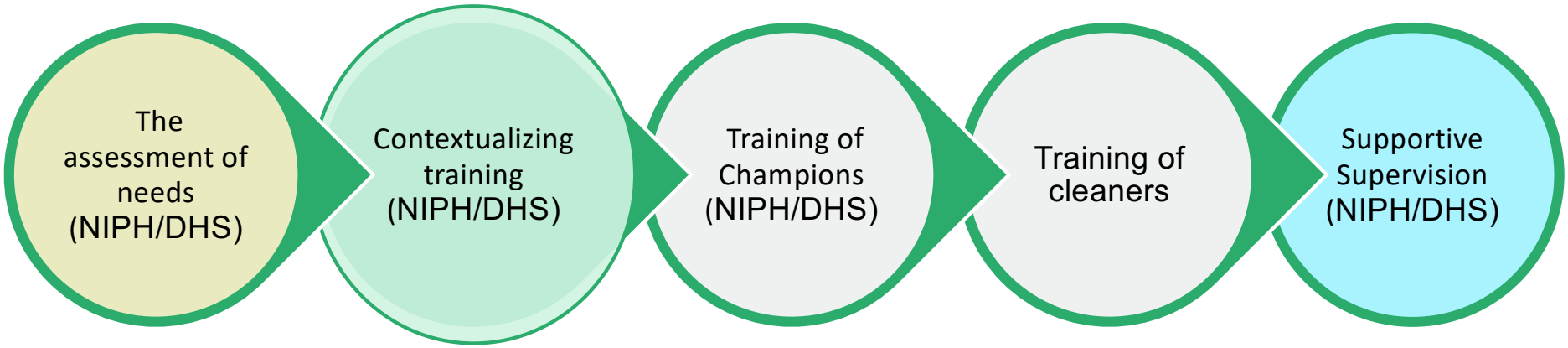
World Health Organization

Key features

- Training of trainers (Cleaning Champions), low cost
- Pedagogical techniques targeting professional adults with low literacy
- Content modules: e.g. cleaning, linen, waste disposal, PPE, intro to IPC, hand hygiene, personal hygiene
- Specific champions modules: how to train, how to supervise
- Focus on adaptation, and alignment with local policies and resources

In Cambodia

- District and provincial referral public hospitals across three provinces: Kampong Chhnang, Battambang, Kratie
- Included the whole hospital but pediatric, maternity and general medicine wards were targeted



Assessment and adaptation

KINGDOM OF CAMBODIA
NATION RELIGION KING

Ministry of Health

National Guidelines
For
Infection Prevention and Control
for Healthcare Facilities
2017

Training

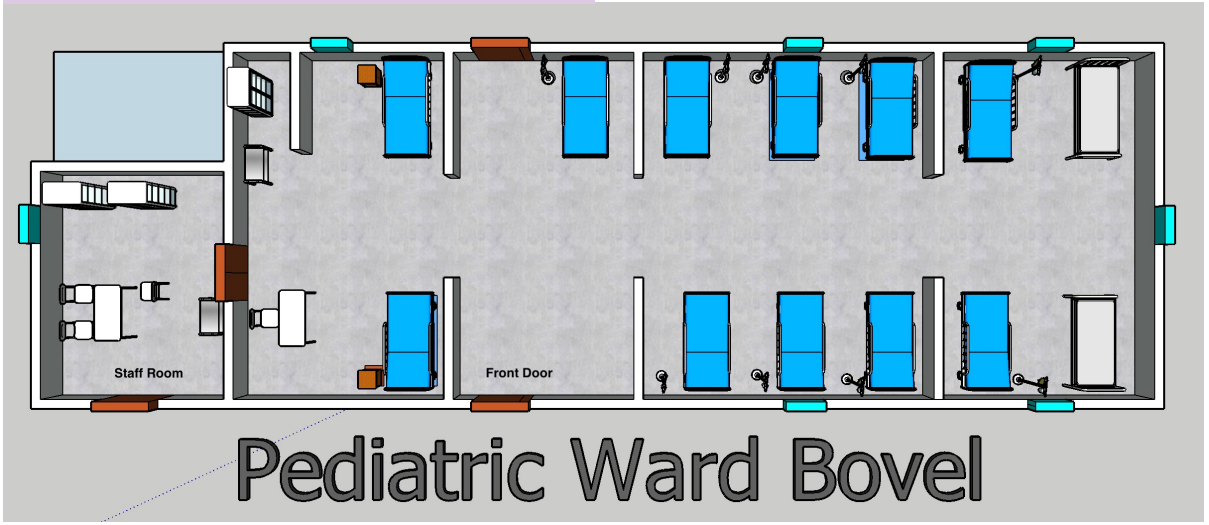
Training technique: the adult learning techniques were applied throughout the trainings

- Presentation with visualization (local pictures/photo/videos),
- Group discussion, paired work, brainstorm
- Demonstration
- The story-telling and sharing experience

52 champions trained

271 facility participants (51 cleaners in targeted wards)

A focus on high touch surfaces and supervision



What does this trial add?

- Can the package be scaled up at national level?
- Does it show an improvement in microbiological cleanliness?
- Are improvements sustained in the longer term?

A stepped-wedge RCT and associated process evaluation

	CLUSTER Size (surfaces sampled)=30	2022								2023	
		MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DEC EMBER	FEBRUARY	MARCH
		PERIOD 1		*PERIOD 2*	*PERIOD 3*		*PERIOD 4*			*PERIOD 5*	
Sequence 1	1	0	0	1	2	2	2	2	2	2	2
Clusters = 3	2	0	0	1	2	2	2	2	2	2	2
	3	0	0	1	2	2	2	2	2	2	2
Sequence 2	4	0	0	0	1	2	2	2	2	2	2
Clusters = 3	5	0	0	0	1	2	2	2	2	2	2
	6	0	0	0	1	2	2	2	2	2	2
	7	0	0	0	0	0	1	2	2	2	2
Sequence 3	8	0	0	0	0	0	1	2	2	2	2
Clusters = 4	9	0	0	0	0	0	1	2	2	2	2
	10	0	0	0	0	0	1	2	2	2	2
Sequence 4	11	0	0	0	0	0	0	0	1	2	2
Clusters = 3	12	0	0	0	0	0	0	0	1	2	2
	13	0	0	0	0	0	0	0	1	2	2

0 is the baseline (white)

1 is ToT (light green)

2 is training at facility and supervision (dark green)

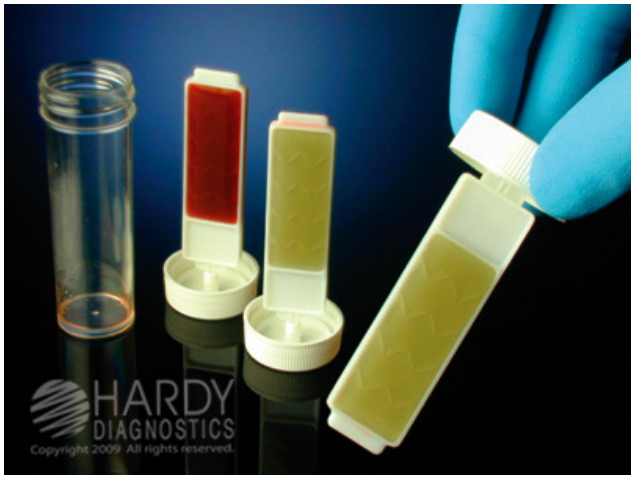
Process evaluation results

The good thing is we can know and classify the high and low touch places…overall, I think the training is so useful as it makes us feel safer when we use what we learn from the training" (T1_CO4_CS)

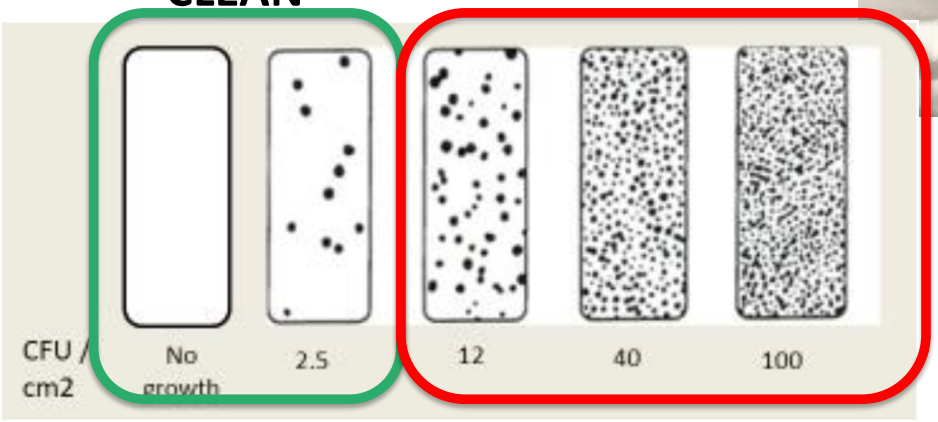
I feel I am more important for the hospital than before. If hospital don't have us, the hospital will be more contaminated. If they don't have us, the health will be more difficult. (T1_CO5_CS)

It is tiring… I have a second job. But now I do not have time to do it anymore" (T1_CO1_CS)

Trial primary outcomes



CLEAN



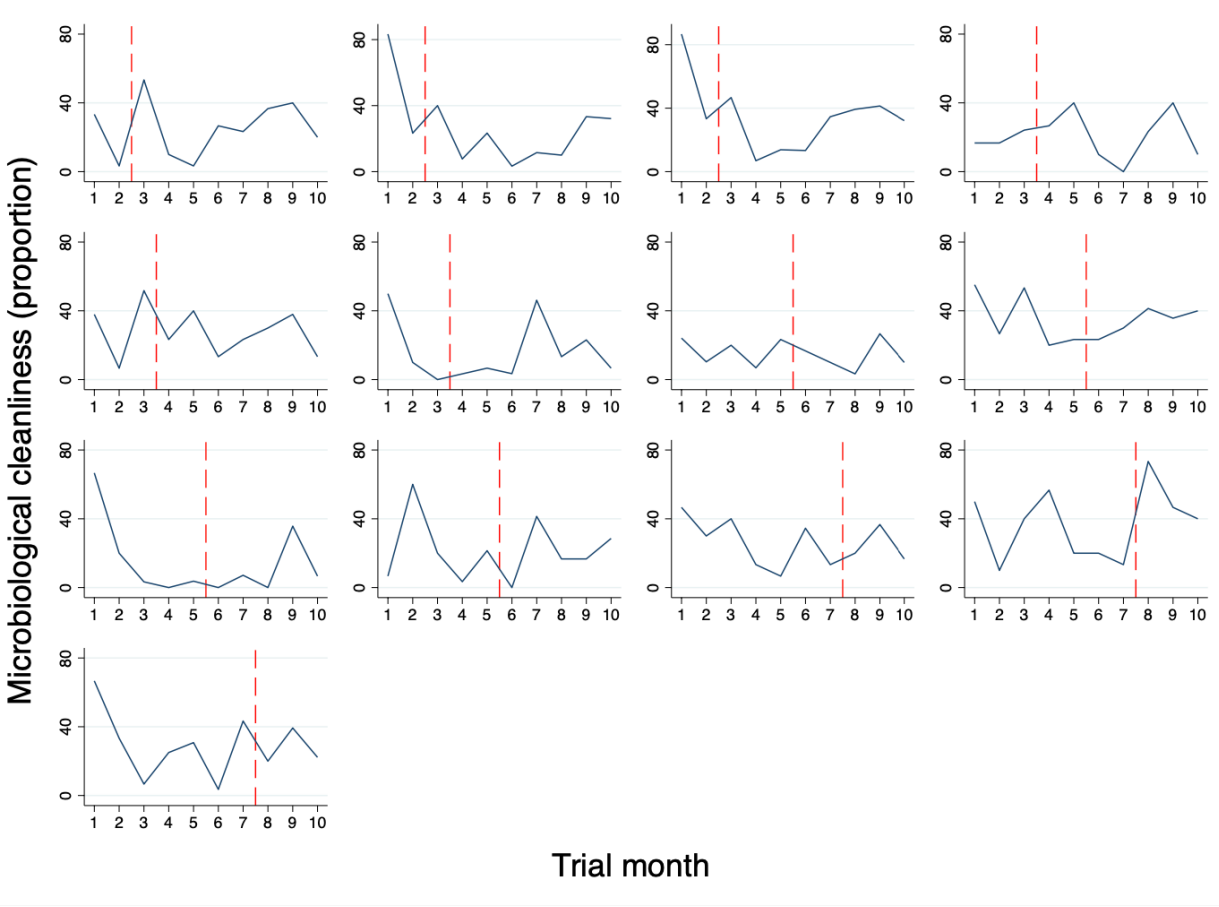
Results

3900 samples (3822 – final analysis

Positive effect of the intervention:

- Odd ratio (Surface level)=1.39, 95% CI=0.95,2.03
- **Risk difference (hospital average)=5.04%,** 95% CI=0.76,9.33

<u>It works at low cost! (USD 5k)</u>



National scale-up

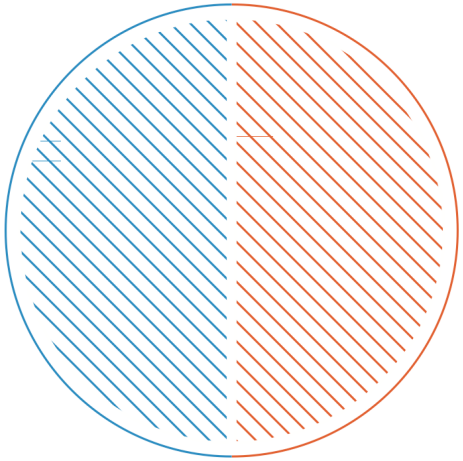
Patient Safety Day – 17th of September

WHO associated methodological guide

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

WHO training package on environmental cleaning

Evaluation methodology guide



World Health Organization

An unfinished research agenda

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

CLEAN Briefing Paper

Research priorities for healthcare cleaning in resource-limited settings

April 2023

Introduction:

Maintaining a clean environment in healthcare settings is essential to the prevention of Healthcare-Associated Infections (HAIs) and the spread of Antimicrobial Resistance (AMR).[1–3] Despite progress, environmental cleaning is more often poorly financed and lacks routine data for monitoring, especially in resource-limited settings. Surveys indicate, for example, limited or no formal training for cleaning staff and a widespread lack of cleaning protocols.[1,4–9] The limited evidence available suggests that environmental contamination is alarmingly high across in-patient hospital wards.[10–14]

Definitions:

Environmental cleaning refers to the application of **water** and **detergent**, and **disinfectant** where necessary, to surfaces and non-critical equipment by **cleaning staff – the cadre of focus**. **Cleaning staff** refers to individuals whose primary responsibility is environmental cleaning. By **professionalisation** of cleaning staff we refer to the process of ensuring that cleaning procedures are adhered to by trained staff who are skilled and work within contractual arrangements (including fair pay and workers' rights) that allow them to perform their duties with dignity, and with acknowledgement of the importance of their role in patient and health worker safety. The focus is on **resource-limited settings** which we define as settings with insufficient individual or societal resources–human, financial or technological to support a robust public healthcare system.[1]

Research prioritisation:

The CLEAN Group undertook an iterative research prioritisation[21,22] process, described in Annex I (CLEAN Briefing – Appendices), between March and October 2022.

Evidence gaps and brief purpose:

Several systematic reviews assessing interventions to improve environmental cleanliness have identified only small-scale, pilot studies in resource limited-settings.[3,15–20] With no rigorous studies available and limited routine data, a multi-stakeholder group (the CLEAN Group) was convened by UK-PHRST in mid-2022 to identify the most urgent (immediate) **research questions** to **inform** or **enhance the implementation** of **best practices in surface** and **non-critical equipment cleaning in healthcare facilities in resource-limited settings**. Addressing these questions will ultimately strengthen the evidence-base on environmental cleaning, which, in turn, **can protect patients and care-givers** from HAIs and limit the spread of AMR in all settings.

Who we are:

The CLEAN Group includes individuals from Africa, Europe, Asia, Australia, North and South America, with expertise in infection prevention and control (IPC), hospital cleaning and disinfection, water, sanitation and hygiene (WASH), health policy, implementation science and clinical research in resource-limited settings. Cleaning staff are indirectly represented.

Solution statement:

We call on **funders to invest** in the research priorities highlighted below, on **policymakers to enable and support** such research, and on **advocates to promote** the need to fill these research gaps and support the most disadvantaged both working in and receiving care in healthcare settings.

The 12 priority research questions to enhance environmental cleaning best practices in healthcare facilities in resource-limited settings

Standards	1	How frequently (and at what diurnal time points) should high-touch surfaces in high-risk units be cleaned and disinfected to achieve adequate bioburden reduction?
	2	What are the human resource requirements to achieve microbiological cleanliness in different types of healthcare settings?
System strengthening	3	What are the minimum requirements at the health system-level to implement environmental cleaning programmes?
	4	What are the health system-level factors that can support the professionalisation of cleaning staff?
	5	What types of communities of practice and practitioners' networks are most useful for supporting environmental cleaning programmes?
Behaviour change	6	What are effective strategies to engage health facility decision makers in investing (financial and managerial commitment) in environmental cleaning?
	7	What are effective training techniques to improve the cleaning practices of cleaning staff?
	8	What are cost-effective strategies to sustain cleaning behaviour (maintaining frequency and quality)?
	9	What are effective behaviour change techniques to establish a facility culture (values and social norms) of environmental cleanliness?
	10	What are effective strategies to involve patients and caregivers in the improvement of environmental cleanliness?
Innovation	11	Is the use of detergents alone non-inferior/sufficient compared to the use of detergents plus disinfectants in reducing bioburden on non-critical/low-touch surfaces?
	12	Are locally produced disinfectants more cost-effective compared to existing (commercially available) disinfectants for bioburden reduction?

Comment | Open access | Published: 27 September 2024

Research priorities to strengthen environmental cleaning in healthcare facilities: the CLEAN Group Consensus

Giorgia Gon ✉, Angela Dramowski, Emilio Hornsey, Wendy Graham, Nasser Fardousi, Alexander Aiken, Benedetta Allegranzi, Darcy Anderson, James Bartram, Sanjay Bhattacharya, John Brogan, An Caluwaerts, Maria Clara Padoveze, Nizam Damani, Stephanie Dancer, Miranda Deeves, Lindsay Denny, Nicholas Feasey, Lisa Hall, Joost Hopman, Laxman Kharal Chettry, Martin Kiernan, Claire Kilpatrick, Shaheen Mehtar, Christine Moe, Stephen Nurse-Findlay, Folasade Ogunsola, Tochi Okwor, Bruno Pascual, Molly Patrick, Oliver Pearse, Alexandra Peters, Didier Pittet, Julie Storr, Sara Tomczyk, Thomas G. Weiser & Habib Yakubu — Show fewer authors

Thank you for listening

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OCTOBER

2 ... Sustainable Healthcare and IPC: Can They Co-Exist? (an IFIC teleclass)
Afro-European Teleclass With Dr. Graham Pike, UK, and Profa. Dra. Camila Quartim de Moraes Bruna, Brazil

7 ... Clean Hospitals Day 2025: Human Factors and Collaboration
Afro-European Teleclass With Dr. Alexandra Peters, Switzerland, and Dr. Martina Močenić, Croatia

15 ... What Can Knowing Something About the Evolution of *Clostridium difficile* Teach Us About IPAC?
Australasian Teleclass With Prof. Thomas Riley, Australia

23 ... Discussion: Are Current Healthcare Cleaning Guidelines Sufficient to Fight Antimicrobial Resistance Spread?
With Dr. Jon Otter, UK & Dr. Curtis Donskey, US

28 ... Research Priorities to Strengthen Environmental Cleaning in Healthcare Facilities: the CLEAN Group Consensus
Afro-European Teleclass With Dr. Giorgia Gon, UK

NOVEMBER

11 ... The Use of Faecal Microbiota Transplant as Treatment for *Clostridium difficile*
Afro-European Teleclass With Simon Goldenberg, UK

13 ... Solve the LTC Outbreak!
With Steven J. Schweon

19 ... Special Lecture for World Toilet Day

DECEMBER

4 ... What's On a Surface Doesn't Stay On a Surface - The Dynamics and Risk of Microbial Resuspension From Surfaces
With Prof. Charles Gerba, US

16 ... Patience, Patients and Persistent Antimicrobial Resistance
Afro-European Teleclass With Colm Dunne, UK

18 ... Empowering Patients to Prevent Healthcare-Associated Infections
With Dr. Curtis Donskey, US

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