

# Throw it away

## How infection control practice destroys planetary health and fuels labour abuse

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Chair in ENT Surgery & Sustainable Healthcare  
Brighton & Sussex Medical School

Consultant and Academic Lead in ENT  
Trust Clinical Green Lead  
University Hospitals Sussex

Founder  
BMA Medical Fair and Ethical Trade Group

THiS Institute Fellow



[www.webbertraining.com](http://www.webbertraining.com)

January 18, 2024

2006

## Fair trade for surgical instruments

Mahmood F Bhutta

We may all be trying to buy fair trade coffee and bananas, but do we know where our surgical instruments are made, and under what conditions?

The global trade in medical commodities amounts to billions of pounds each year (www.standardsandpoors.com), with much trade between the developed and the developing world. The pricing and availability of pharmaceuticals, medical equipment, and biotechnologies, and the potential conflicts of interest and ethical issues, have all been questioned. Perhaps the most publicised case has been that of the provision of affordable medicines to combat the spread of HIV in the developing world,<sup>1</sup> where international pressure resulted in drug companies cutting prices. Many other medical commodities (such as MRI scanners and endoscopic equipment) are too expensive for the developing world because costs of research and development are high.

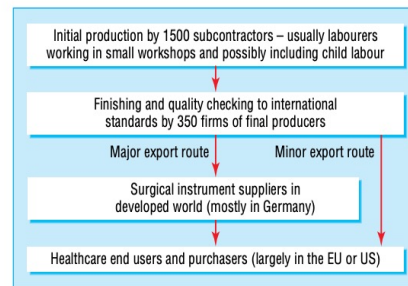


Fig 1 The manufacture and supply process of stainless steel surgical instruments from Pakistan

thebmj

2008

## CLIMATE CHANGE

### Wanted: a green NHS

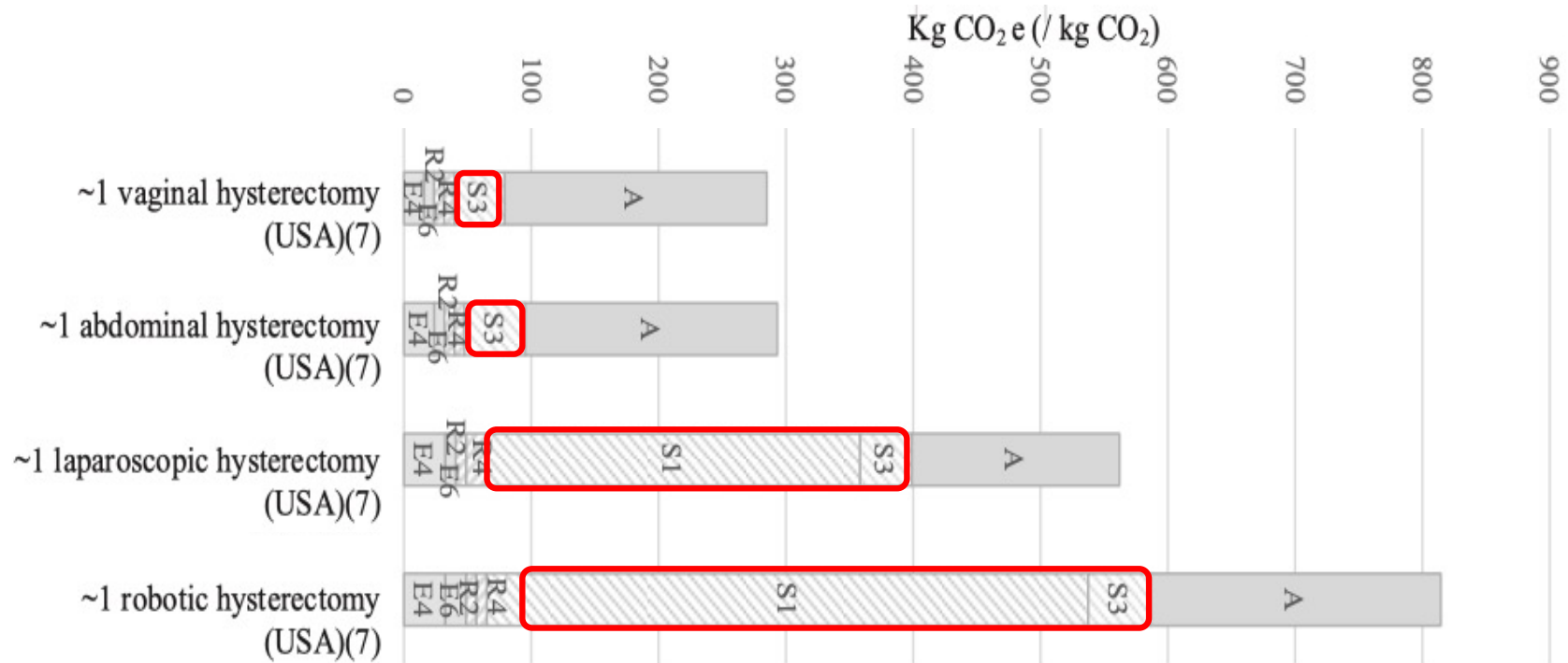
We welcome the *BMJ*'s latest issue on climate change (26 January), which suggests some strategies for health professionals in response to global warming, including adaptation and surveillance and forecasting of health risks.<sup>1</sup> "Climate change: what can doctors do?" asks the *BMJ*'s cover. We believe that doctors must do more than respond to the crisis as it unfolds. Health professionals at all levels must lead by example in their own practices.

Rachel C Stancliffe director, Campaign for Greener Healthcare, Oxford OX2 7LG

rachel.stancliffe@soundshealthy.org

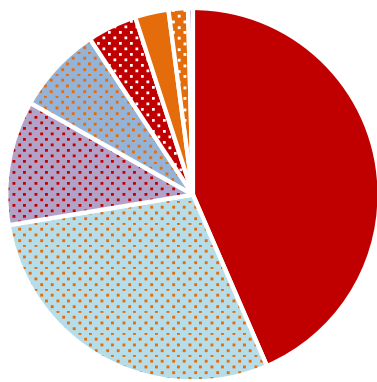
Mahmood Bhutta cofounder, Medical Fair and Ethical Trade Group, c/o International Department, BMA, London WC1H 9JP

# CO<sub>2</sub> of different approaches to hysterectomy

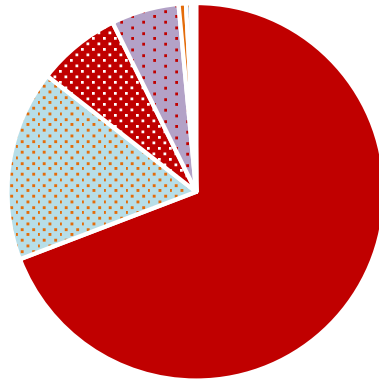


# Contribution to CO<sub>2</sub> from goods in the operating theatre

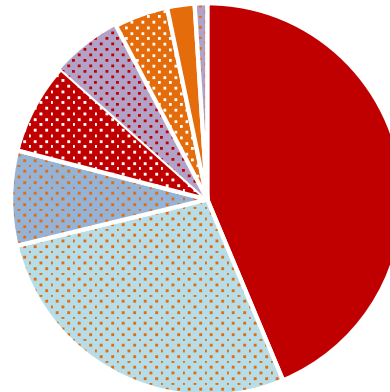
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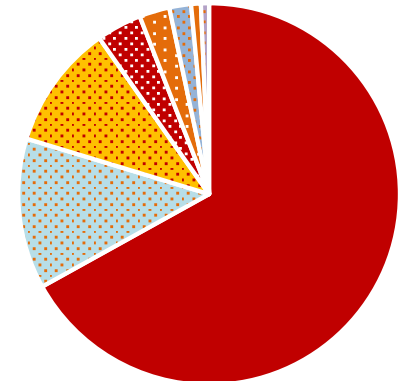
Tonsillectomy



Knee arthroplasty



Laparoscopic cholecystectomy



Carpal tunnel decompression

Production single-use equipment

Decontamination

Waste

68% of carbon of products used is due to single use products

# CO<sub>2</sub> of cataract in different settings

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Cataract operation  
in UK = 182 kg CO<sub>2</sub>



Cataract operation  
in India = 6 kg CO<sub>2</sub>



Highly efficient systems

Reuse of equipment

Lower rates of infective  
endophthalmitis

CO<sub>2</sub> Reduction

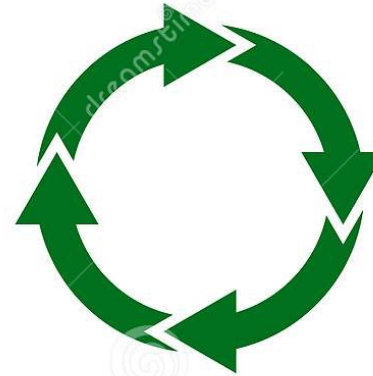
100%

38-56%

3-4% (?)



**REDUCE**



**REUSE**



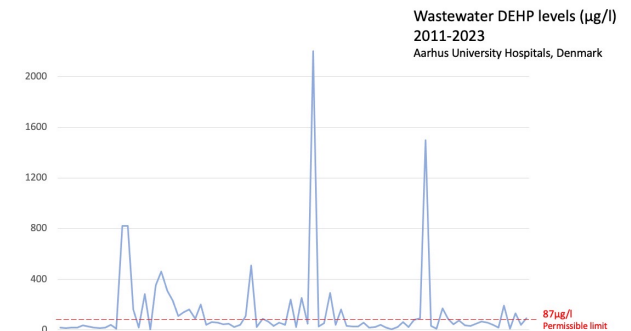
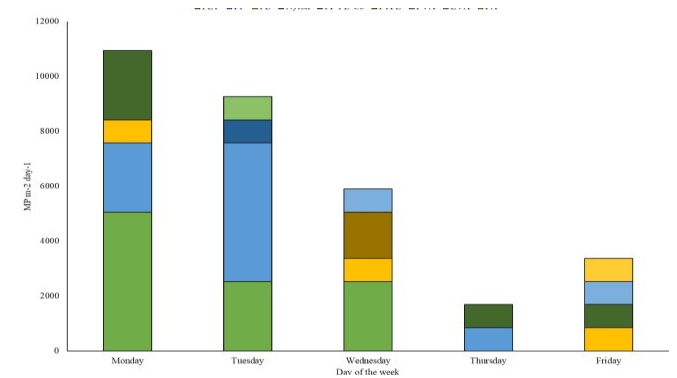
**RECYCLE**

<https://doi.org/10.1093/eurpub/ckac174>

Rizan C et al, in press

# Hospital toxins from over-materialisation

- Estimated **2%** of global plastics used in healthcare
- Microplastics in the operating theatre **3x** background level
- Toxic levels of plasticiser **DEHP** in waste water from Aarhus hospital (Denmark)



Rizan C J R Soc Med 2020;113(2):49-53  
Field DT et al. Environment Intl 2022; 170: 107360

# Free market economics and labour risk

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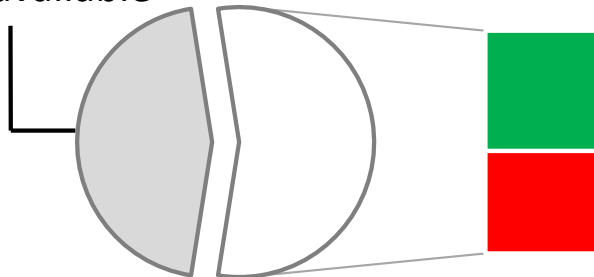


# Country of origin ITUC ranking $\geq 4$



All health contracts  
SE Norway: 2015-16  
(>29,000 items)

45% data  
unavailable



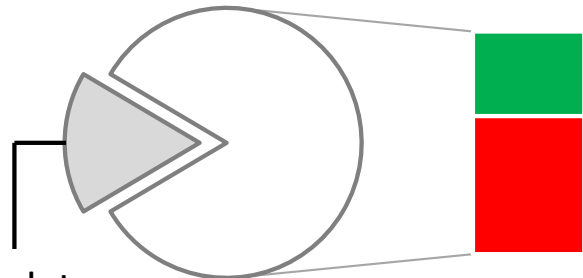
42%

- 5+** No guarantee of rights due to the breakdown of the rule of law
- 5** No guarantee of rights
- 4** Systematic violations of rights
- 3** Regular violations of rights
- 2** Repeated violations of rights
- 1** Sporadic violations of rights



100 items highest  
spend: 2018-19

17% data  
unavailable



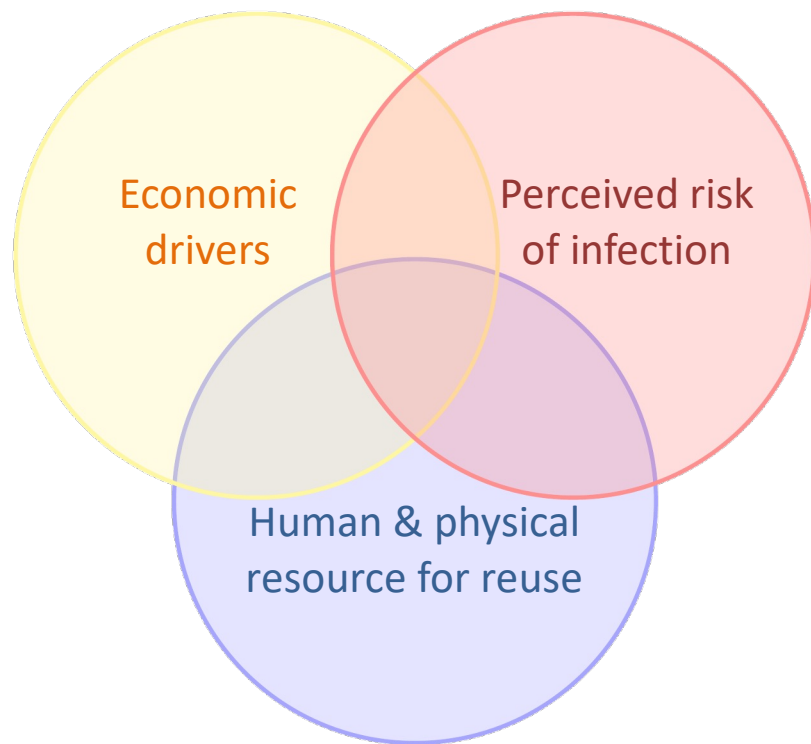
62%



International  
Trade Union  
Confederation

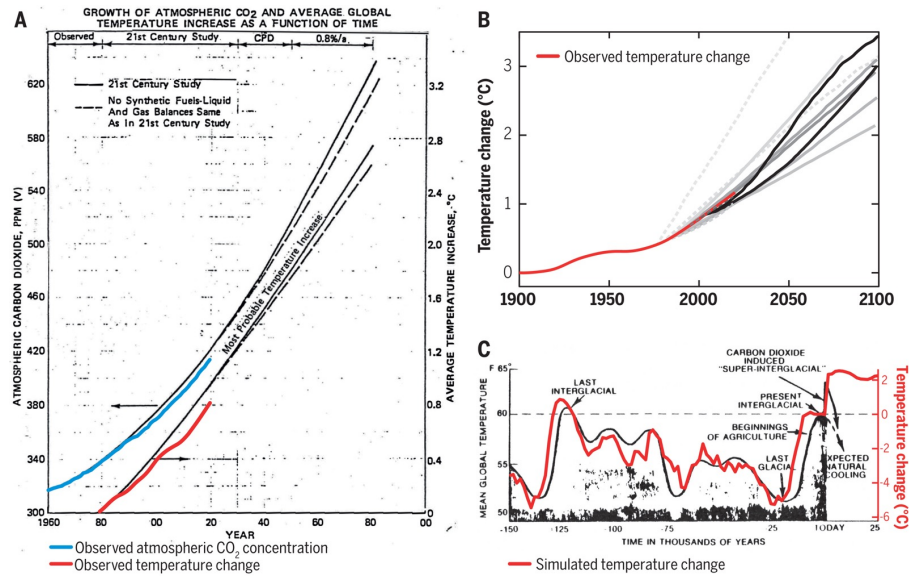
## Incentives and barriers

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# “Washing”

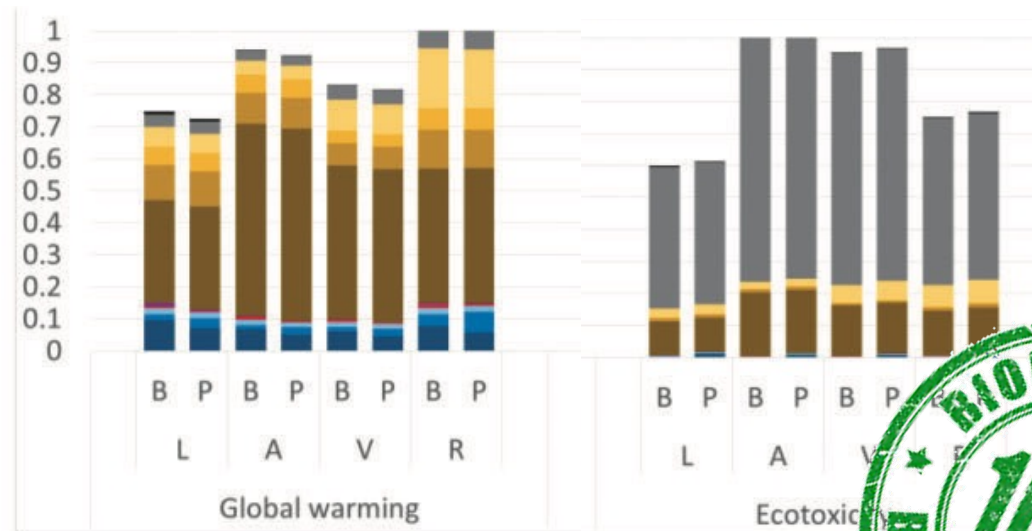
- Whitewash



# ExxonMobil

# “Washing”

- Whitewash
- Greenwash



## “Washing”

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- Whitewash
- Greenwash
- Bluwash



## “Washing”

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- Whitewash
- Greenwash
- Bluewash
- Greywash



Medicines &  
Healthcare products  
Regulatory Agency

Developing our future regulatory framework for medical devices....could include enabling, encouraging and/or requiring manufacturers..... to consider and reduce.....environmental impact

## “Washing”

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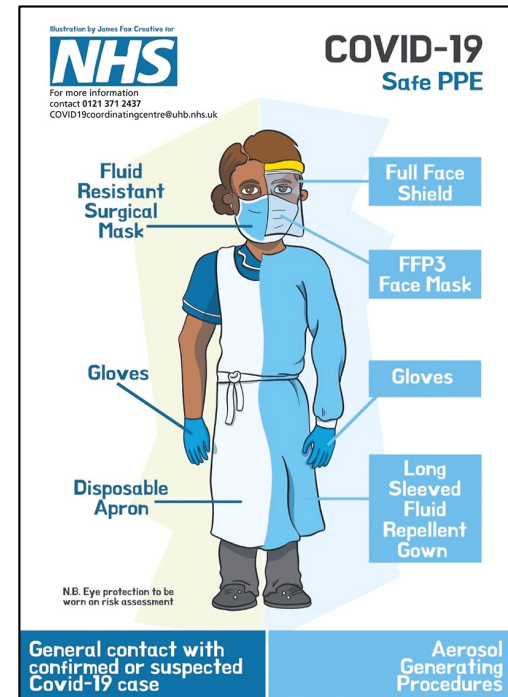
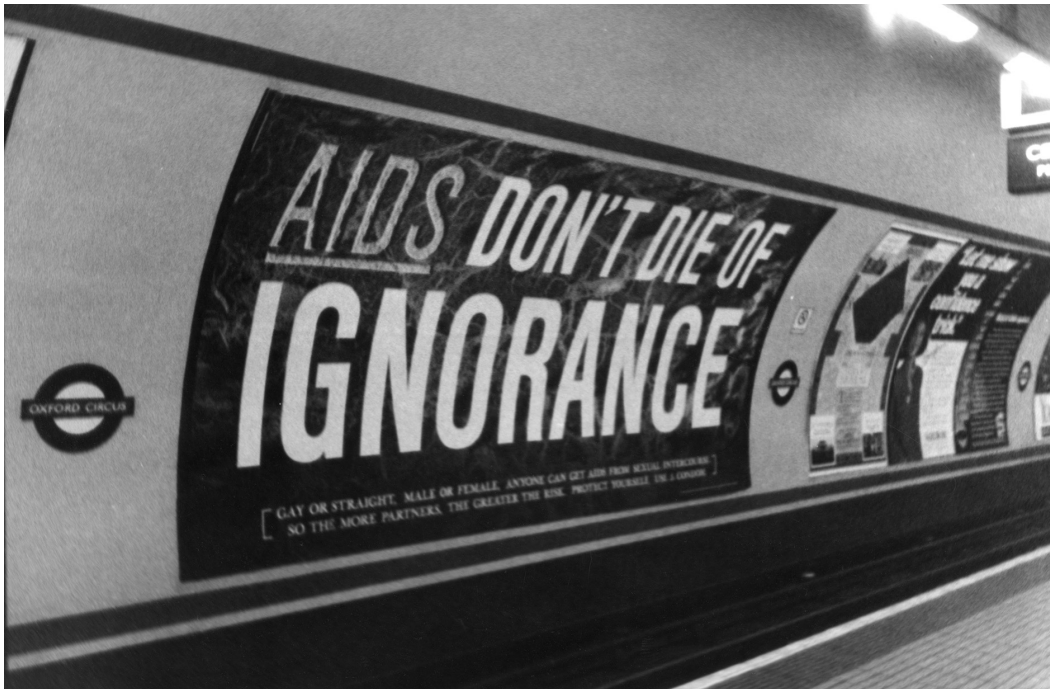
- Whitewash
- Greenwash
- Bluewash
- Greywash
- Yellow-wash



PPE



# Gloves



## Infection risk and gloves

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- **60%** of glove use is inappropriate
  - Only required when expected contact with potentially infected bodily fluids or broken skin
  - Inappropriate use perpetuated by individuals and institutions
  - Puts patients at risk (spreads infection)
- **Glove volumes**
  - **>1.7 billion/annum** in NHS prior to the pandemic
  - If placed end to end would almost stretch to the moon
  - Carbon equivalent to driving a petrol car around the Earth 8300 times



## Infection risk and gloves

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- Perpetuates to public perception....
  - Google image search “vaccination” shows **81%** (81/100) are wearing gloves
  - A survey in Poland two months into the Covid pandemic **93%** (289/312) of people using plastic gloves for shopping



## A new oil refinery in Malaysia

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- A new oil refinery under construction 7.7 million tonnes/annum synthetic rubbers and polymers
- Importing up to 300,000 barrels of oil per day from Saudi Arabia



<https://www.hydrocarbons-technology.com/projects/petronas-rapid-project-malaysia/>



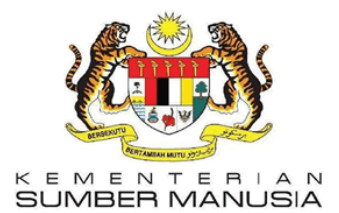
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2021



SUPERMAX Healthcare Limited



ssn medical products



SMART GLOVE International



Forced Labour in the Malaysian Medical Gloves Supply Chain before and during the COVID-19 Pandemic: Evidence, Scale and Solutions

July 2021



MODERN SLAVERY & HUMAN RIGHTS POLICY & TRANSPARENCY STATEMENT  
UK Arts and Humanities Research Council  
Newcastle University  
Brighton and Sussex medical school  
US UNIVERSITY OF SUSSEX  
University of Nottingham  
impact



We feel it is worse than slavery.  
Slaves work for free but we pay  
money to work

Asad (immigrant worker)  
Hartalega gloves factory, Malaysia



# Masks

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2020



*The New York Times*

Textiles

## Infection risk and surgical textiles

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“Drapes and gowns must be made of impervious materials. **Thin cotton drapes and gowns** have no place in orthopaedic surgery”



British  
Orthopaedic  
Association

2014 Consultant Advisory Book

- Knee arthroplasty (>80,000 per annum)
  - 11 drapes/gowns, 14.5kg CO<sub>2</sub> = driving around 72 miles in an average UK car
- **93m** drapes and gowns in UK
  - **60-75%** in the UK are single-use

## Textile performance: standards

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- All health textiles are made of plastics (cotton is obsolete)
- Must meet EN13795 standards **throughout the lifecycle**
  - Reuse is typically 55-75 times and has **one third** carbon footprint



Liquid penetration



Microbial penetration

# Textile performance: single use vs reusable

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Tensile strength  
4x higher with reusable  
10x higher if wet



Burst  
10x lower with reusable



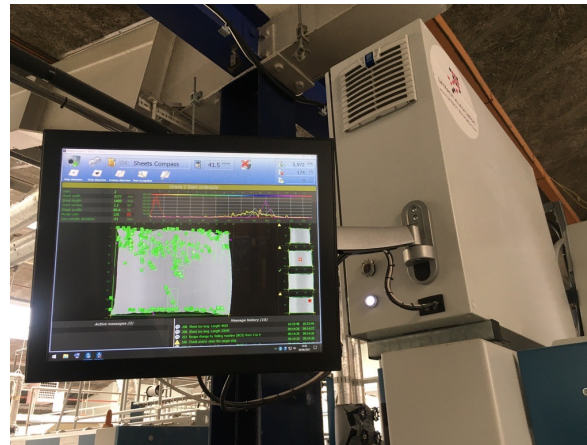
Linting (particle release)  
8x lower with reusable

# Textile laundry and sterilisation standards

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Robust decontamination & sterilisation



HTM 0104



Standards and quality assurance

# Microbiological monitoring

## Bioburden testing on final products

Processing ref. TM-SP-1

Colony Forming Units/100cm<sup>2</sup> (CFU/100cm<sup>2</sup>)

Sample Description/ Alert criteria reference TM-QA-08		-Aerobic Colony Count (ACC) TM-AM-1	Coliforms ● (Presumptive) TM-AM-2	Escherichia coli TM-AM-2	Faecal enterococci TM -AM-3	Staphylococcus aureus TM-AM-4	Fungi (Presumptive) TM-AM-8	Clostridium difficile TM-AM-6	Overall alert status
		≤300	≤5	≤5	≤5	≤5	≤5	Absent	
			6-10	6-10	6-10	6-10	6-10		
		>300	>10	>10	>10	>10	>10	Present	
33	70 X 70 Drape	12	<2	<2	<2	<2	<2	<2	Satisfactory
34	42 x 42 Drape	6	<2	<2	<2	<2	<2	<2	Sat'sfactory
35	Alcoban 100 x 100	4	<2	<2	<2	<2	<2	<2	Satisfactory
36	Alcoban 100 x 140	4	<2	<2	<2	<2	<2	<2	Satisfactory
37	Clean Room Gown	10	<2	<2	<2	<2	<2	<2	Satisfactory

● Coliforms (without E coli and faecal enterococci) regarded as being of environmental origin; Green = ≤5; Amber = 6-25; Red >25

## Gowns in China

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2020





Metal instruments

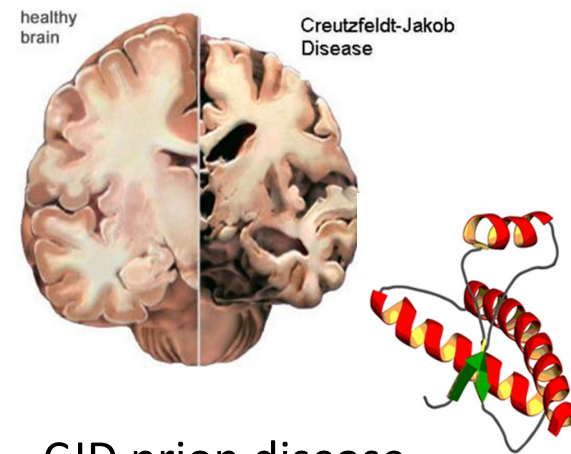
# Infection risk and metal instruments

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1990s



Inconsistent or inadequate  
sterilisation



CJD prion disease

J Hosp Infect, 2001: 48; 180, Quintessence Int 1998 29:231, Inf Control Hosp Epidem 2010; 31: 107  
J Clin Neurosci 2013;20:1207; J Hosp Infect, 2014: 88; 127

# Infection risk and metal instruments

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2020s



Robust decontamination & sterilisation



HTM 0101



Standards and quality assurance

## Single use laryngoscope blades

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- Single use laryngoscope blades in **95%** (21/22) UK hospitals, **2.9m** per year
  - but not in Denmark
- Single use instruments for tonsillectomy in Scotland
  - but not England or Wales
- Prion protein found in **0 / 32,661** tonsil specimens



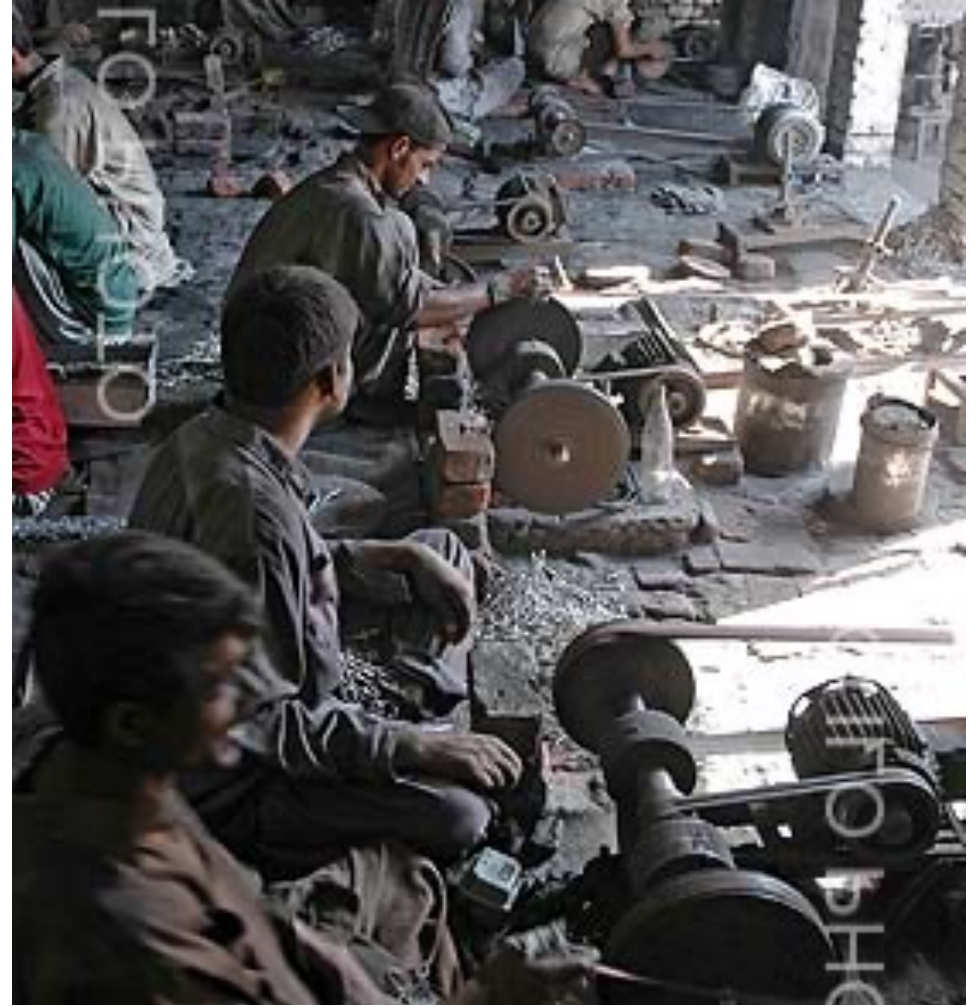
doi: <https://doi.org/10.1136/bmj.b1442>

## Other metal instruments

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- Removal of infrastructure for sterilisation, and compartmentalised costs, has perpetuated this issue
- **52m** single use metal instruments in England (>70% made in high risk countries)
  - Accident and emergency
  - Outpatient clinics (e.g. ophthalmology, ENT, gynaecology)
  - Removal of sutures



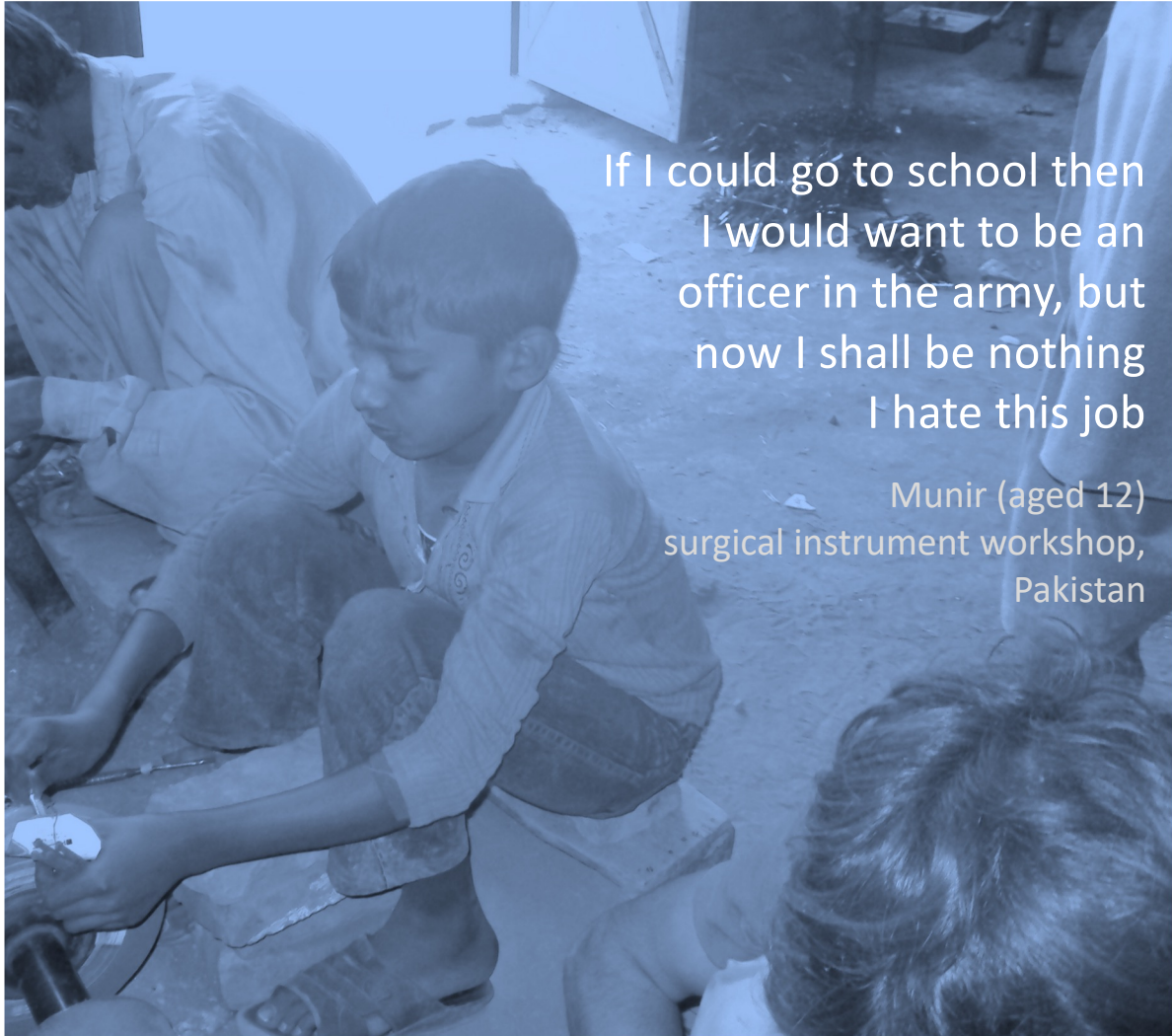






International  
Labour  
Organization





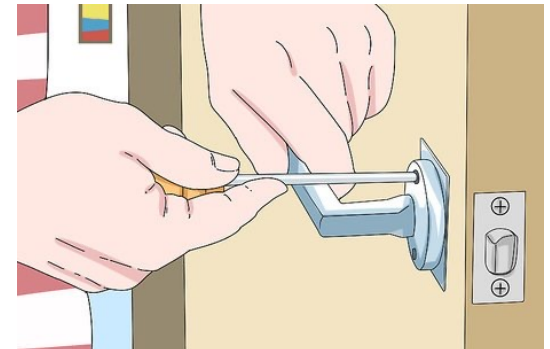
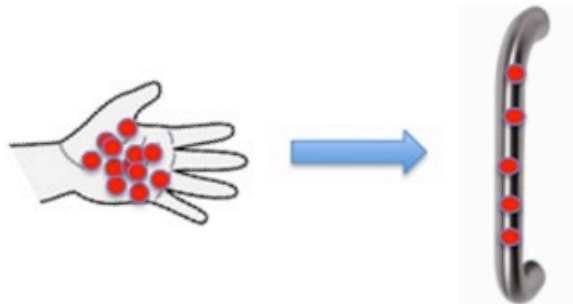
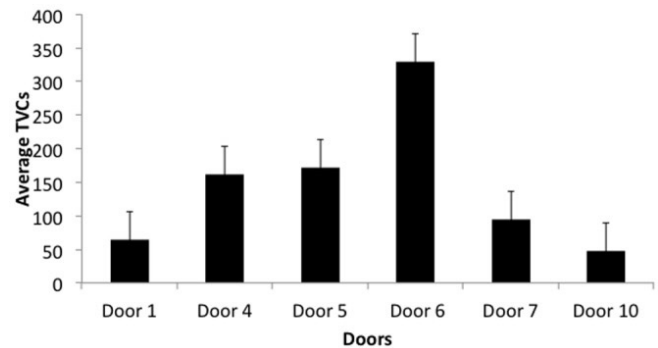
If I could go to school then  
I would want to be an  
officer in the army, but  
now I shall be nothing  
I hate this job

Munir (aged 12)  
surgical instrument workshop,  
Pakistan

And more....

## Infection risk from skin contact

- Single use tourniquets, blood pressure cuffs (common in UK)
- Single use pulse oximeters (USA)
- Single use door handles



## Infection risk from wax

- >330,000 procedures performed in England per annum (HES data)
- Large variation in practice in the equipment used



Equipment	Use routinely	Carbon footprint (g CO <sub>2e</sub> )
Single use sucker	100% (n=18)	3.6
Gloves	83% (n=15)	25
Apron	16% (n=3)	65
Gauze to clean sucker	66% (n=12)	2.1
Plastic tubing	28% (n=5)	130
Suction canister lining	6% (n=1)	78



85 fold increase  
in carbon

## Infection risk through the air

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- Single use surgical wound spray (hospital in UK Midlands)
- Plastic covers for unoccupied beds (central Denmark)



Industry

## Marketing fear

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“A simple change to help limit the unintentional transfer of harmful bacteria is to switch to single-use products.”



(reusable) “drapes and gowns provide no guarantee of ...infection prevention and control management”

# Marketing fear



“The single-use rhinolaryngoscope eliminates the serious potential risk of prion transmission”

Mistry et al, 2020



Department of Health

“there are no known cases of vCJD being transmitted by surgical instruments or endoscopes”

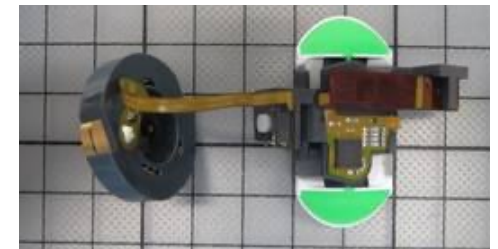
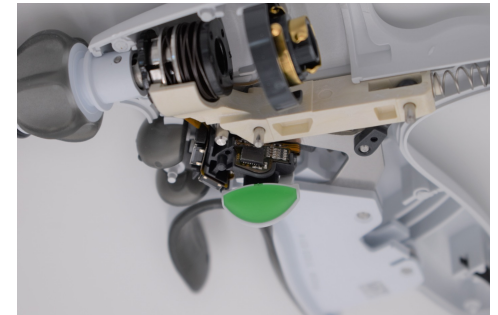
Health Technical Memorandum 01-06





# Planned obsolescence

Johnson & Johnson



48m electrocautery products



## Industry response

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- Mock me
  - Single use light handles



## Industry response

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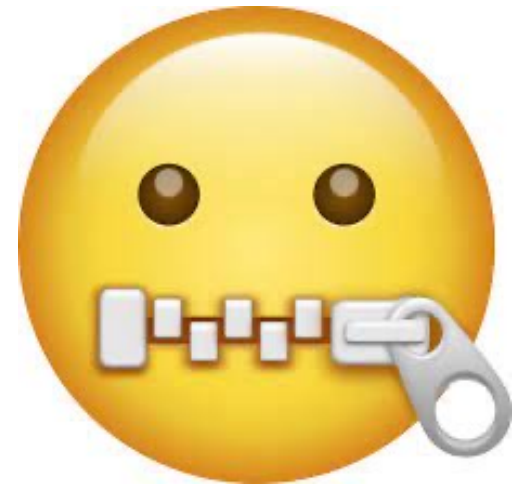
- Mock me
  - Single use light handles
- Harass me
  - Single use scopes



## Industry response

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- Mock me
  - Single use light handles
- Harass me
  - Single use scopes
- Silence me
  - Single use drapes and gowns



## Industry response

---

- Mock me
  - Single use light handles
- Harass me
  - Single use scopes
- Silence me
  - Single use drapes and gowns
- **Threaten legal action**
  - Glove suppliers with labour abuse

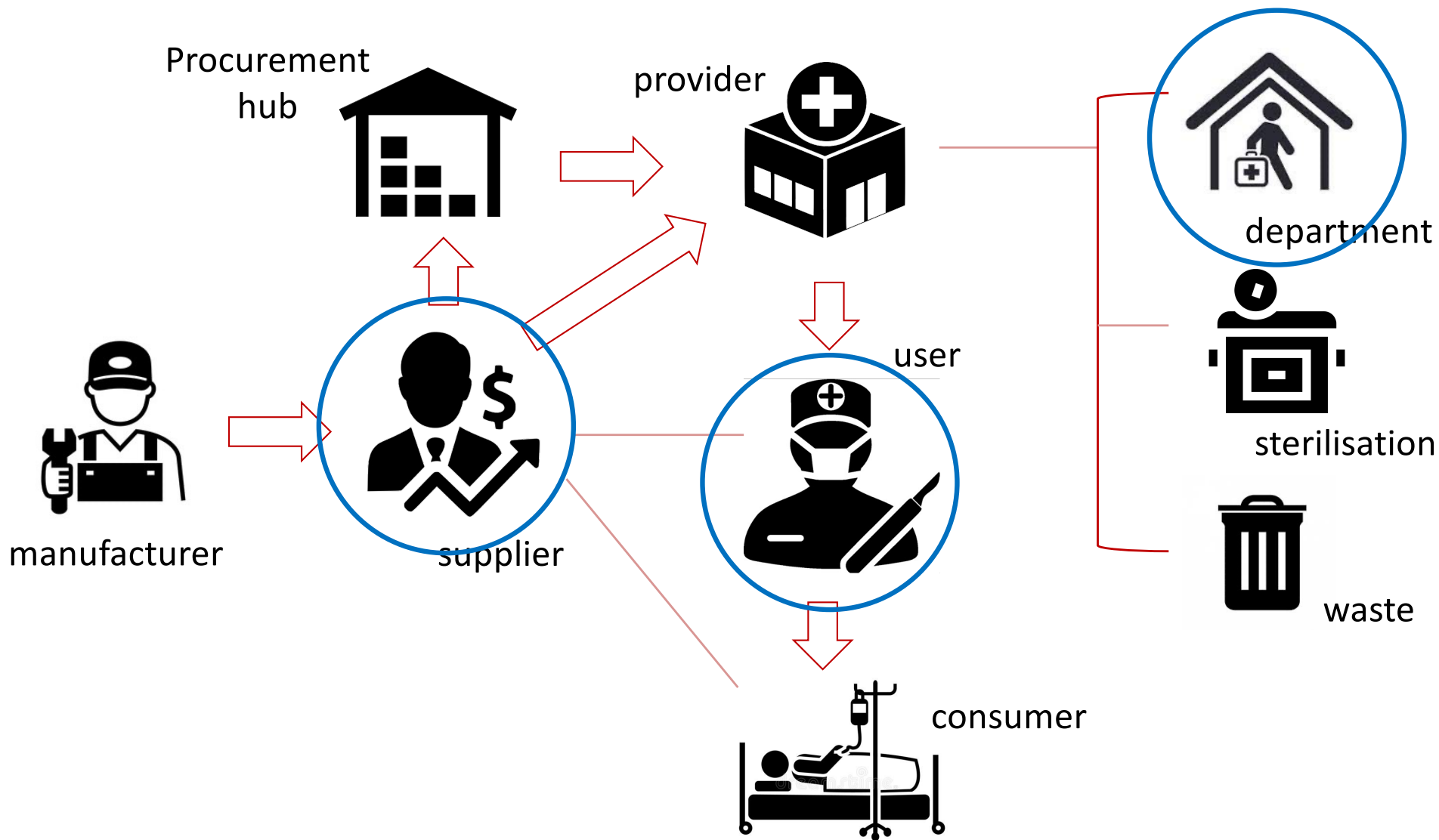


## Yellow-washing

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- A stated or implied risk of infection that is disproportionate to infection control evidence or principles
- May lead to planetary and societal harm, for example through promoting disposal of medical products or perpetuating mysophobia (germophobia).
- May be driven by a lack of literacy in infection control principles (including attempts to conceal such deficiency) and/or by economic incentives.







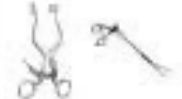
Solutions?



## Knowledge and policy

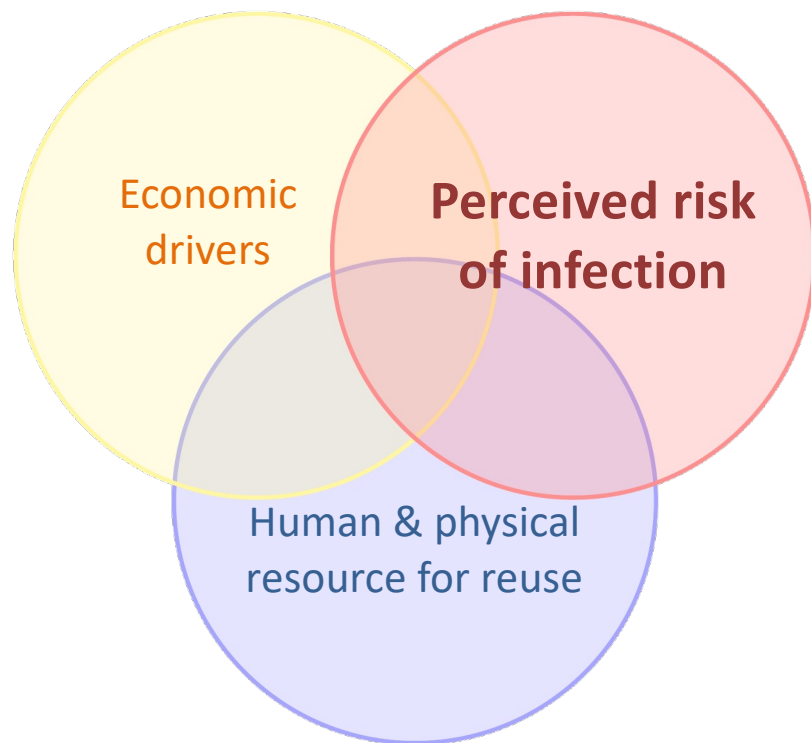
- Education
  - To counter the lack of expertise
  - To protect the reputation of your profession
- National and international policy
  - Spaulding classification
  - To standardize practice and promote planetary and societal health
  - To build economic and supply resilience in health systems

### Spaulding classification

Patient Contact	Examples	Device Classification	Minimum Inactivation Level
Intact skin		Non-Critical	Cleaning and/or Low/Intermediate Level Disinfection
Mucous membranes or non-intact skin		Semi-Critical	High Level Disinfection
Sterile areas of the body, including blood contact		Critical	Sterilization

# Changing incentives and barriers

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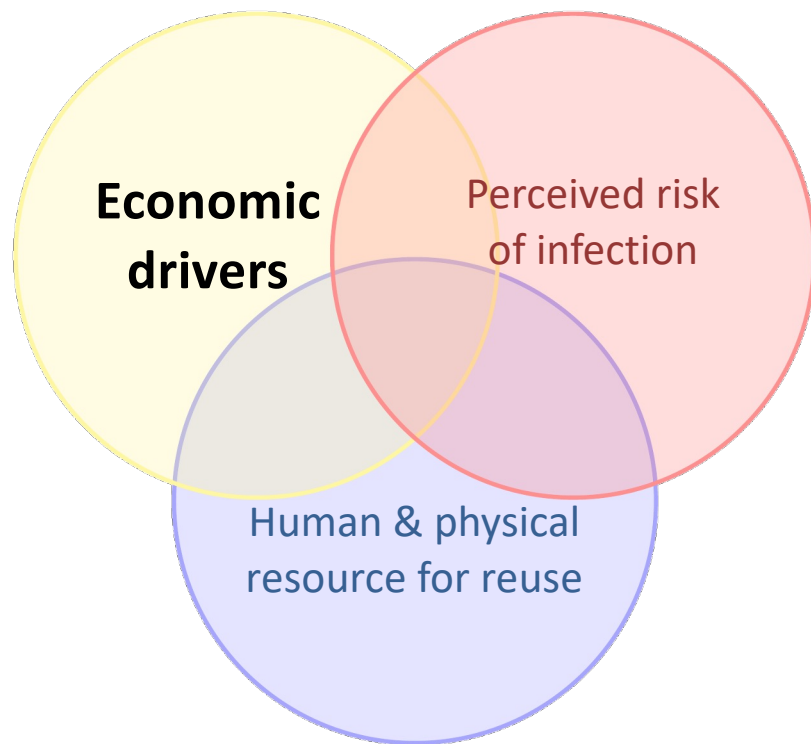


National / international  
guidance on infection risk



# Changing incentives and barriers

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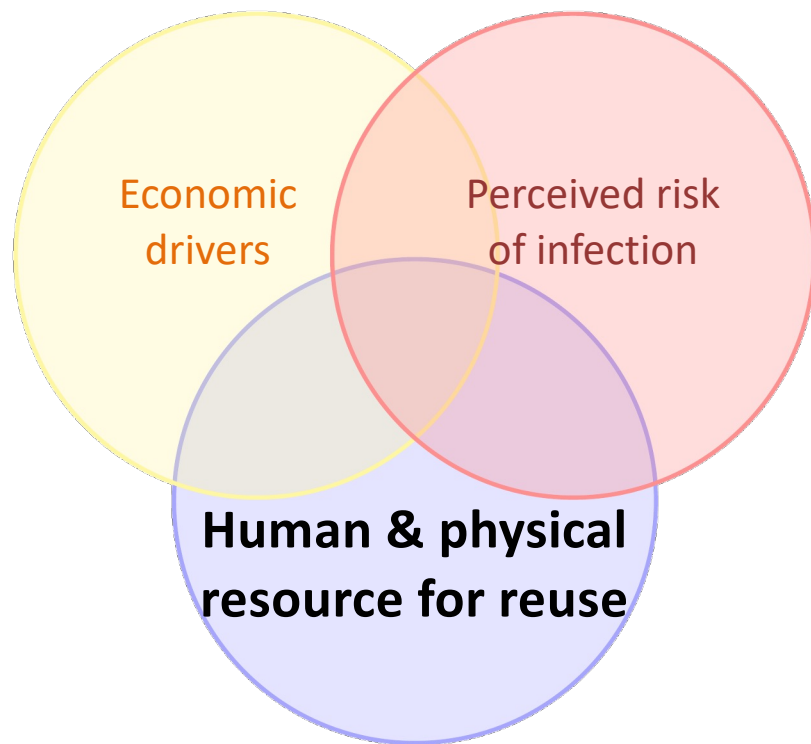
Whole system finance  
(and costs savings)

Economic servitisation



## Changing incentives and barriers

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Expand national infrastructure for textiles and equipment

Expand point of care infrastructure for reuse

Explore other methods for sterilization and decontamination



## Lead the change

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- Support and champion reduce and reuse in your work
- Educate and inform others
- Support national and international policy development

[www.bsms.ac.uk/about/sustainability.aspx](http://www.bsms.ac.uk/about/sustainability.aspx)



m.bhutta@bsms.ac.uk



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*(FREE Teleclass)*

February 1, 2024

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Speaker: **Dr. Sally Bloomfield**, International Scientific Forum on Home Hygiene

February 8, 2024

**TARGETED HYGIENE: A RISK-BASED APPROACH TO APPLYING POLICIES AND HYGIENE INTERVENTIONS IN PUBLIC SETTINGS AND LARGE EVENTS**

Speaker: **Dr. Lisa Ackerley**, International Scientific Forum on Home Hygiene

*(Australasian Teleclass)*

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

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