Clean Your Hands: Stop the Spread of Drug Resistant Germs
Prof Didier Pittet, World Health Organization
Sponsored by the WHO First Global Patient Safety Challenge – Clean Care is Safer Care

<table>
<thead>
<tr>
<th>WHO Clean Care is Safer Care Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clean Your Hands:</strong></td>
</tr>
<tr>
<td><strong>Stop the Spread of Drug-Resistant Germs</strong></td>
</tr>
<tr>
<td><strong>Today is World Hand Hygiene Day!</strong></td>
</tr>
</tbody>
</table>

**Professor Didier Pittet**
Infection Control Programme & WHO Collaborating Centre on Patient Safety
University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland

**Hosted by:**
Dr. Edward Kelley
World Health Organization

**Sponsored by WHO Patient Safety Challenge Clean Care is Safer Care**

**Hand Hygiene – a global life saving action**

Launched October 2005

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**WHO 5 May over the years**

<table>
<thead>
<tr>
<th>Year</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Clean Your Hands</td>
</tr>
<tr>
<td>2009-2013</td>
<td>Clean Your Hands</td>
</tr>
<tr>
<td>2014</td>
<td>Clean Your Hands</td>
</tr>
</tbody>
</table>

---

**5 May 2014 The start of the idea**

**Describing 5 May 2014 – WHO & the world!**
- New scientific information
- Data to drive future action
- Providing patient and public information
- A focus on advocacy, awareness raising and engagement
- SAVE LIVES: Clean YOUR Hands around the world!

---

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WHO Global Report and Infographic on AMR

Newly issued on 30 April 2014

AMR Global Report - Key messages

- Data for any of the selected 9 bacteria–antibacterial drug combinations of public health importance obtained from 114 Member States
- AMR is a serious and current threat to public health in every WHO region, with the potential to affect anyone, of any age, in any country
- Systematic literature reviews on health and economic burden due to AMR in infections caused by resistant *Escherichia coli*, *K. pneumoniae*, and MRSA
  
  Patients with infections caused by resistant bacteria generally have an increased risk of worse clinical outcomes and death, and consume more health-care resources

*Klebsiella pneumoniae: Resistance to third-generation cephalosporins*

<table>
<thead>
<tr>
<th>Region</th>
<th>National data</th>
<th>Published data</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Region</td>
<td>6–77</td>
<td>9–89</td>
</tr>
<tr>
<td>Region of the Americas</td>
<td>4–71</td>
<td>15–56</td>
</tr>
<tr>
<td>Eastern Mediterranean Region</td>
<td>22–50</td>
<td>6–75</td>
</tr>
<tr>
<td>European Region</td>
<td>2–82</td>
<td>4–61</td>
</tr>
<tr>
<td>South-East Asian Region</td>
<td>34–81</td>
<td>5–106</td>
</tr>
<tr>
<td>Western Pacific Region</td>
<td>1–72</td>
<td>2–15–35</td>
</tr>
</tbody>
</table>

*Based on at least 30 selected bacterial isolates

*Published data are comparable to national data, but not from the same countries

*Escherichia coli: Resistance to third-generation cephalosporins*

<table>
<thead>
<tr>
<th>Region</th>
<th>National data</th>
<th>Published data</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Region</td>
<td>2–70</td>
<td>0–87</td>
</tr>
<tr>
<td>Region of the Americas</td>
<td>0–48</td>
<td>0–68</td>
</tr>
<tr>
<td>Eastern Mediterranean Region</td>
<td>22–83</td>
<td>2–91</td>
</tr>
<tr>
<td>European Region</td>
<td>3–12</td>
<td>0–6</td>
</tr>
<tr>
<td>South-East Asian Region</td>
<td>16–69</td>
<td>19–96</td>
</tr>
<tr>
<td>Western Pacific Region</td>
<td>0–77</td>
<td>0–75</td>
</tr>
</tbody>
</table>

*Based on at least 30 selected bacterial isolates

*Published data are comparable to national data, but not from the same countries

Klebsiella pneumoniae: Resistance to carbapenems

<table>
<thead>
<tr>
<th>Region</th>
<th>National data</th>
<th>Published data</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Region</td>
<td>0–4</td>
<td>-</td>
</tr>
<tr>
<td>Region of the Americas</td>
<td>0–11</td>
<td>0–2</td>
</tr>
<tr>
<td>Eastern Mediterranean Region</td>
<td>0–54</td>
<td>0–21</td>
</tr>
<tr>
<td>European Region</td>
<td>0–68</td>
<td>2–7</td>
</tr>
<tr>
<td>South-East Asian Region</td>
<td>0–8</td>
<td>0–59</td>
</tr>
<tr>
<td>Western Pacific Region</td>
<td>0–8</td>
<td>0–11</td>
</tr>
</tbody>
</table>

*Based on at least 30 selected bacterial isolates

*Published data are comparable to national data, but not from the same countries

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Staphylococcus aureus: Resistance to beta-lactam antibiotics (i.e. methicillin-resistant S. aureus, MRSA)

<table>
<thead>
<tr>
<th>Region</th>
<th>Reported range of resistance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National data</td>
<td>Published data</td>
</tr>
<tr>
<td>African Region</td>
<td>12-40</td>
</tr>
<tr>
<td>Region of Americas</td>
<td>18-80</td>
</tr>
<tr>
<td>Eastern Mediterranean Region</td>
<td>21-60</td>
</tr>
<tr>
<td>European Region</td>
<td>0.3-60</td>
</tr>
<tr>
<td>South-East Asian Region</td>
<td>10-26</td>
</tr>
<tr>
<td>Western Pacific Region</td>
<td>4-84</td>
</tr>
</tbody>
</table>

Summary results
- From Jan. 1980 to Dec. 2013
- 39 studies on hand hygiene as the key intervention implemented in the study period and including data about impact on MDROs’ infection and/or transmission rates, as well as on hand hygiene indicators, were identified
- Only 14/39 studies failed to demonstrate an impact of hand hygiene interventions or improvement in the MDRO’s infection and/or colonization
- One of these studies did not show any significant improvement of hand hygiene compliance, thus explaining the failure to reduce infections, while another study was a low-quality retrospective study.
- Additional 60 studies investigated the impact of hand hygiene (HH) to reduce MDRO’s infections as part of interventions including other infection control measures
- "Impact of hand hygiene to reduce transmission and infections by MDROs in health-care settings: a systematic literature review"

Impact of hand hygiene on reduction of MDROs
- Gram negative bacteria
  - Clinical studies also supported data showing lower incidence rates of resistant E. coli and carbapenem resistant P. aeruginosa in wards achieving compliance levels higher than 70% and the greatest degree of compliance increase
  - Increased in HH Compliance from 43.3% to 65.6% resulted in 8.9% decrease in HAIs and a decline in the occurrence of bloodstream, MRSA and extensively drug-resistant Acinetobacter baumannii and intensive care unit infections
  - "A Lean Six Sigma Team Increases Hand Hygiene Compliance and Reduces Hospital-Acquired MRSA Infections by 51%"
  - "A Lean Six Sigma Team Increases Hand Hygiene Compliance and Reduces Hospital-Acquired MRSA Infections by 51%"

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Increase in hand hygiene compliance and reduction of MDROs

Australian National Hand Hygiene Initiative

England & Wales National Hand Hygiene Initiative

Informing the world about the results

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"An alarming and irreversible crisis on the same level as global warming"

The science, Hunnet et al, 2013
- The annual societal cost-of-illness for AMR is considered to be roughly $55 billion for the US alone, maybe higher
- Suboptimal infection control is a factor in spread of resistant microorganisms
- The public must be aware of the scale of AMR threat, and must perceive antimicrobials as a non-renewable & endangered resource
- Infection control including hand hygiene is still performed sub-optimally, contributing to spread AMR
- Tackling AMR requires action on multiple levels!

The call to action
- Action: prohibit over-the-counter antimicrobials sales worldwide
- Action: prep of a detailed charter on antimicrobial conservation now; ratified and upheld by all ministries of health
- Action: develop coordinated, culturally sensitive campaigns for the public; give info on protecting antimicrobials 'a limited resource'
- Action: Support the improvement of sanitation systems to eliminate resistant microbes in waste water & include hand washing advice
- Action: establish standardized, universal methods & metrics for surveillance of antimicrobial use & resistance development
- Action: Medical & veterinary school curricula to ensure instruction on microbial resistance & use of antimicrobials
- Action: advance point-of-care rapid diagnostics to avoid the prescription of antibiotics for viral infections

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The WHO Global AMR Surveys - 2014

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WHO laboratory-based global survey on multidrug-resistant organisms (MDROs) in health care – interim analysis

- **Aim:** to estimate the burden of MDROs isolated among inpatients in a wide range of health-care facilities worldwide
- **Design:** online survey (1st March–13 April 2014) based on the routine, ordinary collection of clinical blood and urine (MSU & CSU) culture specimens over one week
- **Participants:** health-care settings registered for the WHO SAVE LIVES: Clean Your Hands global campaign and other WHO-associated networks
- **Submissions:** 334 laboratories
- **54 countries**
- **All 6 WHO regions**

**MDROs included in the survey: definitions**

- **MRSA** Staphylococcus aureus resistant to methicillin/oxacillin/cefoxitin
- **VRE** Enterococci spp. resistant to glycopeptide antibiotics (i.e. vancomycin or teicoplanin)
- **ESBL** Gram-negative organisms that mediate resistance to extended-spectrum third generation cephalosporins, (e.g. oxacillin, ceftazidime, and ceftriaxone) and monobactams (e.g. aztreonam) but do not affect cephamycins (e.g. cefoxitin and cefotetan) or carbapenems (e.g. meropenem and imipenem)
- **CRE** Enterobacteriaceae that produce any β-lactamase that hydrolyses carbapenems (any or all of ertapenem, doripenem, imipenem and meropenem) and are resistant to all of the following third-generation cephalosporins: ceftazidime, ceftriaxone, and cefotaxime.
- **MRAB** Multi-resistant Acinetobacter spp.: Isolate resistant to at least 3 classes of antimicrobial agents, i.e. all penicillins and cephalosporins (including inhibitor combinations), fluoroquinolones, and aminoglycosides.

**S. aureus isolated from blood and urine samples and related resistance – interim analysis**

**E. coli isolated from blood and urine samples and related resistance – interim analysis**

**Klebsiella spp isolated from blood and urine samples and related resistance – interim analysis**
Clean Your Hands: Stop the Spread of Drug Resistant Germs
Prof Didier Pittet, World Health Organization
Sponsored by the WHO First Global Patient Safety Challenge – Clean Care is Safer Care

**Acinetobacter spp isolated from blood and urine samples and related resistance – interim analysis**

<table>
<thead>
<tr>
<th>WHO REGIONS*</th>
<th>N° countries</th>
<th>N° labs.</th>
<th>Acinetobacter spp (N° isolates)</th>
<th>MRAB (N° isolates, % of MRAB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUROPE</td>
<td>20</td>
<td>200</td>
<td>60</td>
<td>8 (13%)</td>
</tr>
<tr>
<td>EMR</td>
<td>6</td>
<td>32</td>
<td>50</td>
<td>13 (40%)</td>
</tr>
</tbody>
</table>

*MRAB: Eastern Mediterranean Region
Based on at least 30 isolated isolates

**WHO Global Survey on Surgical Antibiotic Prophylaxis (SAP) in Health Care – interim analysis**

- **Aim**: to present information on prevalence and duration of SAP prescribed in a wide range of health-care facilities worldwide
- **Design**: online survey (10 March-13 April 2014) with submission of data about SAP related to all patients having had surgery over the 3 working days before the survey day
- **Participants**: health-care facilities registered for the WHO SAVE LIVES: Clean Your Hands global campaign and other WHO-associated networks
- **Submissions**: 357 health-care facilities
- **8 199 patients**
- **50 countries, all 6 WHO regions**
  *Defined as: Administration of systemic antibiotics before a surgical procedure (within 60 min) with possible repetition during the operation, depending on its duration.

**WHO Global Survey 2014 INTERIM RESULTS**

**Type of surgical ward**

- Gen Surg
- Obs & Gynec
- Orthop
- Urol
- Others
- NA

**WHO Regional Distribution of Patients**

<table>
<thead>
<tr>
<th>WHO REGIONS – INTERIM RESULTS</th>
<th>N° countries</th>
<th>N° health-care facilities</th>
<th>N° patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRICA</td>
<td>7</td>
<td>37</td>
<td>833</td>
</tr>
<tr>
<td>AMERICAS</td>
<td>12</td>
<td>51</td>
<td>840</td>
</tr>
<tr>
<td>SOUTH-EAST ASIA</td>
<td>2</td>
<td>6</td>
<td>235</td>
</tr>
<tr>
<td>EUROPE</td>
<td>17</td>
<td>222</td>
<td>5791</td>
</tr>
<tr>
<td>EASTERN MEDITERRANEAN</td>
<td>6</td>
<td>22</td>
<td>196</td>
</tr>
<tr>
<td>WESTERN PACIFIC</td>
<td>6</td>
<td>19</td>
<td>554</td>
</tr>
<tr>
<td>TOTAL</td>
<td>50</td>
<td>357</td>
<td>8,199,39</td>
</tr>
</tbody>
</table>

**Number of antibiotics given for surgical prophylaxis**

- One Antibiotic
- Two Antibiotics
- Three Antibiotics

**Frequency of administration by Region**

- **Single preoperative dose**
- **Single preoperative + repeat perioperatively**
  - Every 12 h
  - Every 6 h

**WHO Global Survey 2014 INTERIM RESULTS**

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**Antibiotic prophylaxis continuation after the operation**

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td></td>
</tr>
<tr>
<td>Western Pacific</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td></td>
</tr>
<tr>
<td>Eastern Med</td>
<td></td>
</tr>
<tr>
<td>Americas</td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td></td>
</tr>
</tbody>
</table>

**Antibiotic continuation by Wound Class**

<table>
<thead>
<tr>
<th>Wound Class</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean</td>
<td>32%</td>
</tr>
<tr>
<td>Clean-contaminated</td>
<td>48%</td>
</tr>
<tr>
<td>Contaminated</td>
<td>36%</td>
</tr>
<tr>
<td>Dirty &amp; infected</td>
<td>43%</td>
</tr>
</tbody>
</table>

**Antibiotic prophylaxis continuation by surgical procedure**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>% YES</th>
<th>% NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>1200</td>
<td>1400</td>
</tr>
<tr>
<td>Cardiac</td>
<td>1400</td>
<td>1200</td>
</tr>
<tr>
<td>Gynecology</td>
<td>1000</td>
<td>1400</td>
</tr>
<tr>
<td>Neurological</td>
<td>2000</td>
<td>1000</td>
</tr>
<tr>
<td>Vascular</td>
<td>2000</td>
<td>1000</td>
</tr>
<tr>
<td>General</td>
<td>1400</td>
<td>1200</td>
</tr>
<tr>
<td>Average</td>
<td>1000</td>
<td>1400</td>
</tr>
</tbody>
</table>

**Reason for antibiotic continuation (%)**

- Inadequate sterility or OR conditions: 1%
- Other: 0%
- Unknown: 6%
- Surgeon’s preference: 30%
- To prevent SSI: 29%
- Departmental Guidelines: 8%

Describing 5 May 2014 – WHO & the world!

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“Hand hygiene is the frontline defense against infections”

JEANINE THOMAS, MRSA SURVIVORS NETWORK

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New patient and public information on AMR

Hand hygiene and Antibiotic Resistance
WHO information for Patients and Consumers

What is antibiotic resistance? Sometimes an antibiotic that works to fight a certain type of bacterial infection no longer works. This happens when the bacteria change and are no longer sensitive or inhibited by the antibiotic. The antibiotic may do no harm to the patient but it will not cure an infection caused by these bacteria. In other words, the bacteria become resistant and can continue to multiply in a patient’s body even while taking the antibiotic. The term for this is antibiotic resistance and it is usually caused by the overuse and misuse of antibiotics.

Save lives! Clean your hands! Stop the spread of drug resistant germs!

Clean Hands Save Lives – helping the public to understand the story

THIERRY CROUZET
CLEAN HANDS
SAVE LIVES

FOREWORD
Dr. Margaret Chan
WHO Director-General
Sir Liam Donaldson
WHO Patient Safety Envoy
CleanHandsSaveLives.org

Informing the public – the influence of social media

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SAVE LIVES: Clean YOUR Hands around the world!

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My 5 Moments for Hand Hygiene
Focus on caring for a patient with a Urinary Catheter

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Countries with health-care facilities registered for SAVE LIVES: Clean Your Hands global campaign

We have reached 17,026 registrations from 171 countries for 5 May 2014

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Congratulations to
- New countries since 2013:
  - Guinea
  - Montenegro
  - Barbados!

Example organisation websites

Example country activities

Example hospital activity images

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The Story
- In Costa Rica… "During the dry season water shortages are an issue, so there was a need for an alternative method for cleaning hands in healthcare."
- "It was also important to address compliance with WHO recommended actions to prevent HAI, including from drug-resistant bacteria."
- "Early reports showed hand hygiene compliance was as low as 40%.”……
- "Alcohol-based hand rub is available throughout the hospital at patients’ bedside and in health centres in Costa Rica following WHO recommendations.”
- "Patients have benefited since there are fewer infections in the hospitals."


The Future
- www.who.int/gpsc5may
- www.cleanhandssaveslives.org
- Social Media:
  - Follow WHO on Facebook and Twitter @WHO
  - Follow @didierpittet on Twitter

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Using innovative ways around the world to apply the 5 Moments
Translated in:
- French
- Portuguese
- Japanese
- Spanish
- German
- Chinese
- Russian
- Romanian
- Turkish
Available soon:
- Gujarati
- Urdu

Continue to use the WHO Hand Hygiene Self-assessment Framework
Assessment
Action

http://www.who.int/gpsc/5may/hhsa_framework/en/

Apply now – http://www.handhygieneexcellenceaward.com

2014 WHO Teleclass Schedule

Jan 29
Innovation and implementation of strategic approaches to reduce catheter-related bacteremia: The results of a European multicentre study (PROHIBIT)
Dr. Walter Zieglm, Switzerland

March 7
How to prevent the spread of multiresistant bacteria
Dr. Stephan Harberth, Switzerland

April 9
Highlights on SSI prevention: The new CDC guidelines and more
Dr. Joseph Solomon, USA

May 5
Special lecture for International Hand Hygiene Day
Prof. Didier Pittet, Switzerland

Sept 3
New WHO global campaign to eliminate unsafe therapeutic injections
Dr. Benedetta Allegranzi, Switzerland

Oct 8
Public reporting and disclosure of HAI rates: Positive impact or confusion?
Dr. Maryanne McGurk, USA

Nov 5
Global application of behaviour change models and infection control strategies
Dr. Michael Borg, Malta

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