Barley Chironda
Infection Control Specialist
Clorox HealthCare

Epidemiologically Important Pathogens are everywhere

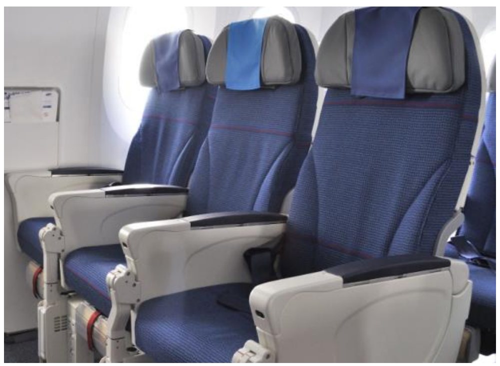
Disclaimer

Disclosures: Employee of Clorox HealthCare and a volunteer with the Cdiff Foundation.

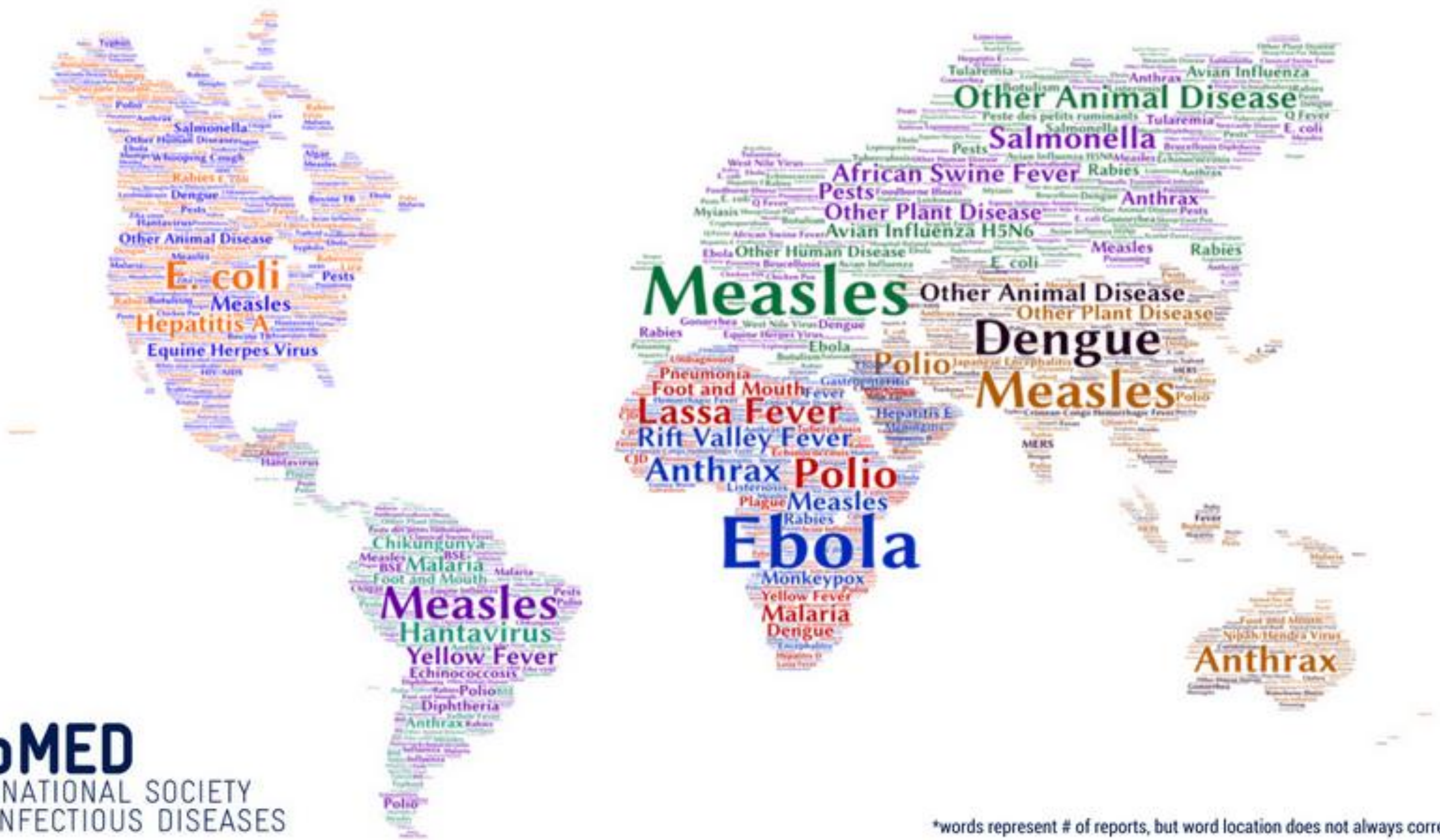
Views expressed are those of the presenter and do not necessarily reflect the organizations I belong too.

CLOROX HEALTHCARE®



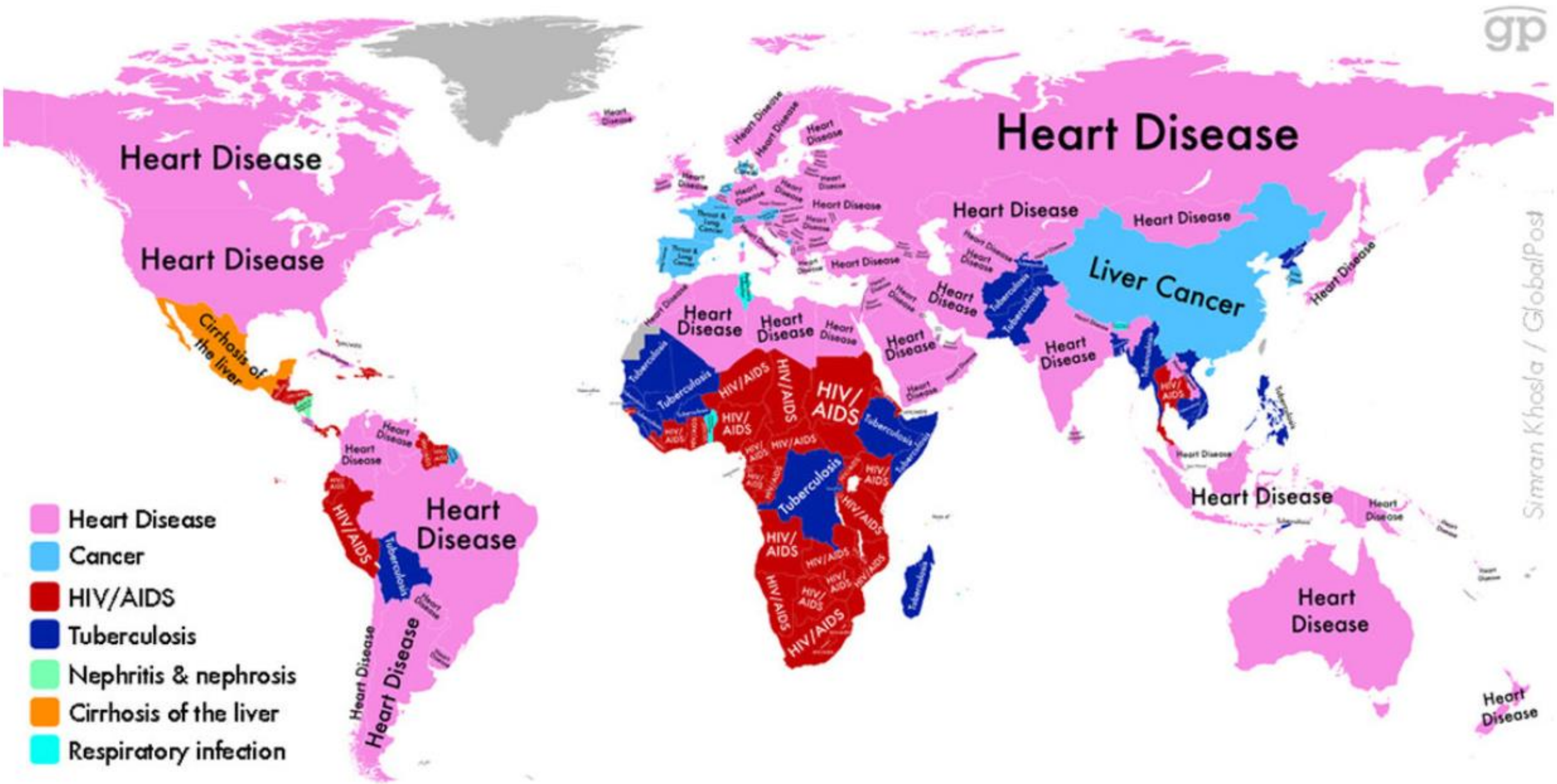




APRIL - JUNE 2018 REPORTS TO ProMED



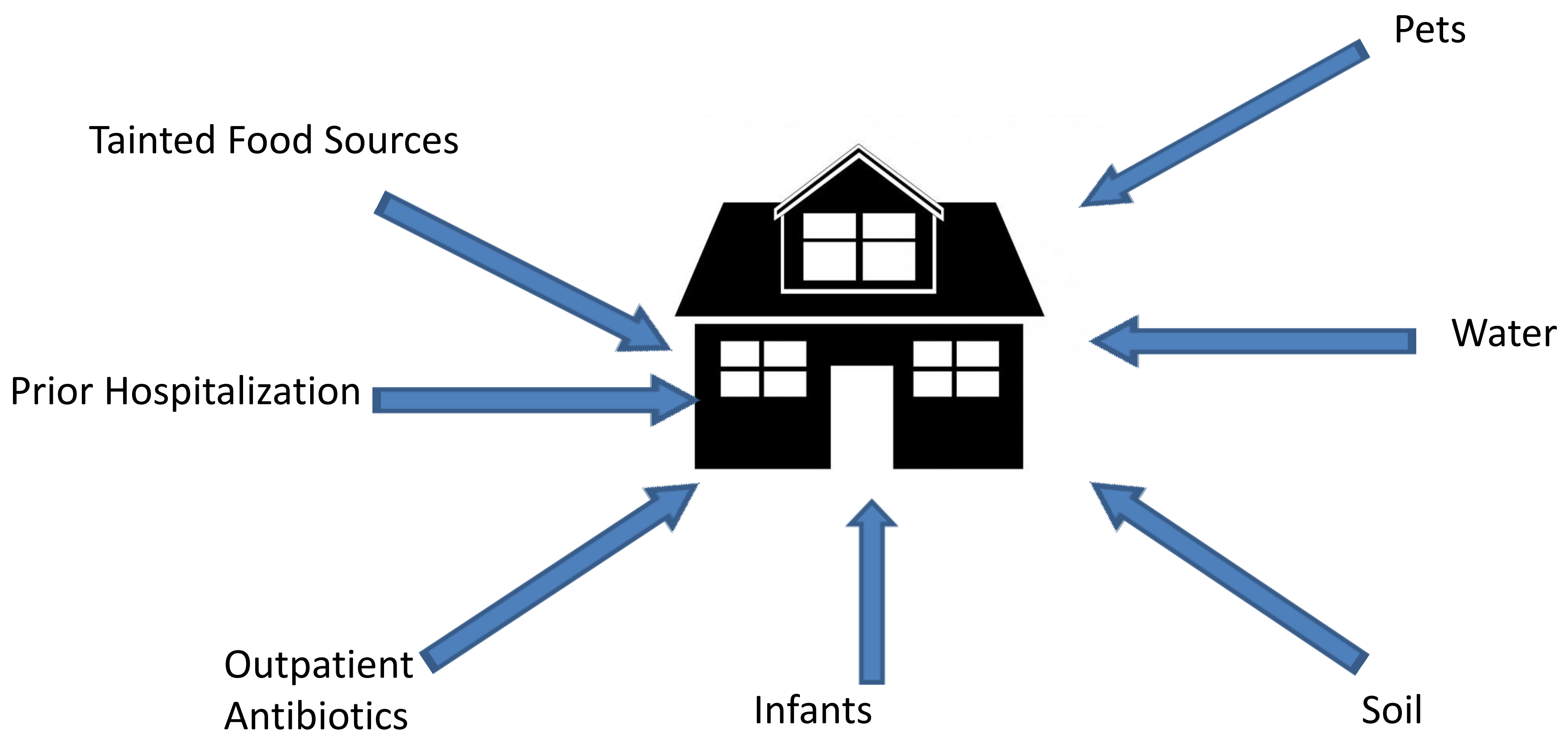
ProMED
INTERNATIONAL SOCIETY
FOR INFECTIOUS DISEASES

*words represent # of reports, but word location does not always correspond to the exact location



Heart Disease
Heart Disease
Heart Disease
Cirrhosis of the liver
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Tuberculosis
HIV/AIDS
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Heart Disease
HIV/AIDS
HIV/AIDS
Tuberculosis
Tuberculosis
HIV/AIDS
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Liver Cancer
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Heart Disease
Cancer
HIV/AIDS
Tuberculosis
Nephritis & nephrosis
Cirrhosis of the liver
Respiratory infection
gp
Simran Khosla / GlobalPost

Pathogens are Everywhere



1. **Clostridium difficile infection: Early history, diagnosis and molecular strain typing methods Authors C. RodriguezJ. Van Broeck B. Taminiau et al. Source Information August 2016, Volume97(Issue Complete) Page p.59To-78 - Microbial Pathogenesis**
2. **Lund, B. M., & Peck, M. W. (2015). A Possible Route for Foodborne Transmission of Clostridium difficile? Foodborne Pathogens and Disease, 12(3), 177–182. http://doi.org/10.1089/fpd.2014.1842**
3. **http://www.cidrap.umn.edu/news-perspective/2019/03/resistance-genes-wastewater-shown-mirror-clinical-resistance**
4. Pedati C, Koirala S, Safranek T, Buss BF, Carlson AV. Campylobacteriosis Outbreak Associated with Contaminated Municipal Water Supply — Nebraska, 2017. MMWR Morb Mortal Wkly Rep 2019;68:169–173. DOI: http://dx.doi.org/10.15585/mmwr.mm6807a1: http://dx.doi.org/10.15585/mmwr.mm6807a1

HAZARD LEVEL URGENT

- *Clostridioides difficile*
- Carbapenem-resistant Enterobacteriaceae (CRE)
- Drug-resistant *Neisseria gonorrhoeae*

HAZARD LEVEL SERIOUS

- Multidrug-resistant *Acinetobacter*
- Drug-resistant *Campylobacter*
- Fluconazole-resistant *Candida*
- Extended-spectrum Beta-lactamase producing Enterobacteriaceae
- Vancomycin-resistant *Enterococcus* (VRE)
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant non-typhoidal *Salmonella*
- Drug-resistant *Salmonella* Serotype Typhi
- Drug-resistant *Shigella*
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Drug-resistant *Streptococcus pneumoniae*
- Drug-resistant Tuberculosis

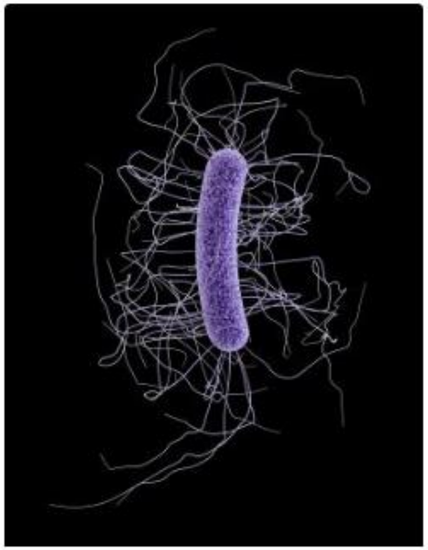
HAZARD LEVEL CONCERNING

- Vancomycin-resistant *Staphylococcus aureus* (VRSA)
- Erythromycin-Resistant Group A *Streptococcus*
- Clindamycin-resistant Group B *Streptococcus*

Source Stats and images https://www.cdc.gov/drugresistance/biggest_threats.html

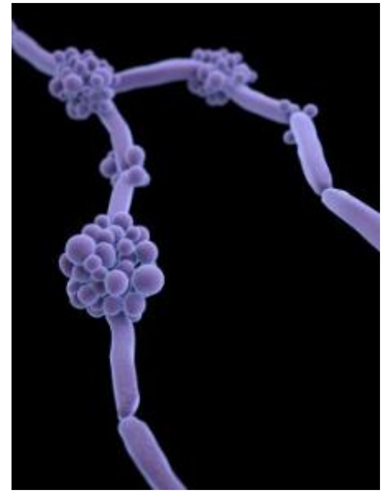
Healthcare Facilities

Clostridioides difficile

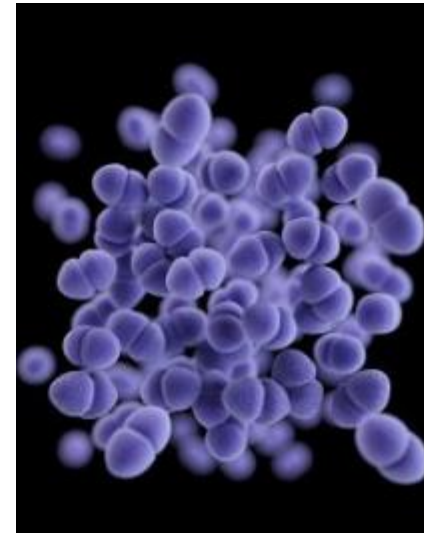


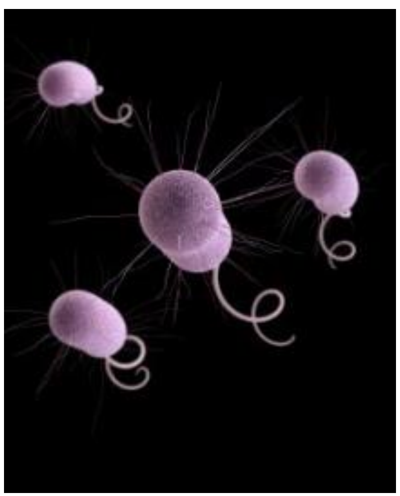
CPE

C.Auris

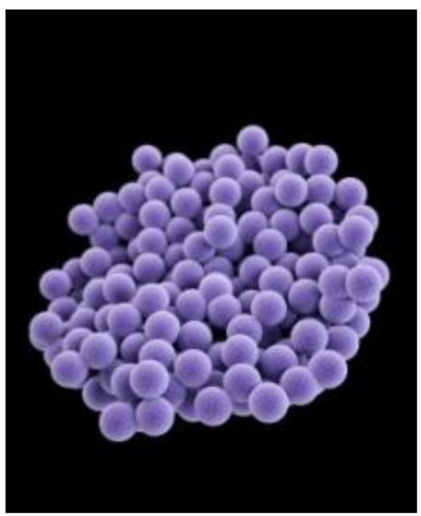


VRE





MDR Pseudomonas



MRSA

Strep Pneumo

Source Stats and images https://www.cdc.gov/drugresistance/biggest_threats.html

MDR TB

Infections per year 2,000

MDR *Salmonella*

Infections per year 100,000

MDR *Neisseria gonorrhoeae*

Infections per year: 246,000

MDR *Campylobacter*

Drug-resistance infections per year: 310,000

Source Stats and images https://www.cdc.gov/drugresistance/biggest_threats.html

Urgent Threats

- *Clostridioides difficile*
- Carbapenem-resistant Enterobacteriaceae (CRE)
- Drug-resistant *Neisseria gonorrhoeae*

Serious Threats

- Multidrug-resistant *Acinetobacter*
- Drug-resistant *Campylobacter*
- Fluconazole-resistant *Candida*
- Extended-spectrum Beta-lactamase producing Enterobacteriaceae
- Vancomycin-resistant *Enterococcus* (VRE)
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant non-typhoidal *Salmonella*
- Drug-resistant *Salmonella* Serotype Typhi
- Drug-resistant *Shigella*
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Drug-resistant *Streptococcus pneumoniae*
- Drug-resistant Tuberculosis

Concerning Threats

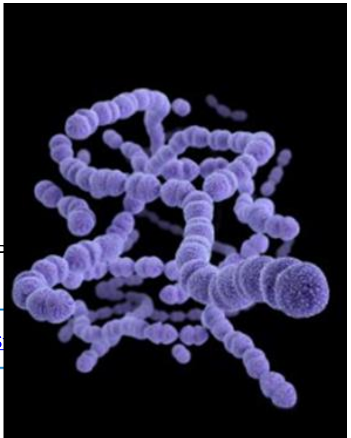
- Vancomycin-resistant *Staphylococcus aureus* (VRSA)
- Erythromycin-Resistant Group A *Streptococcus*
- Clindamycin-resistant Group B *Streptococcus*

WHAT ACCOUNTS FOR MOST INFECTIONS?

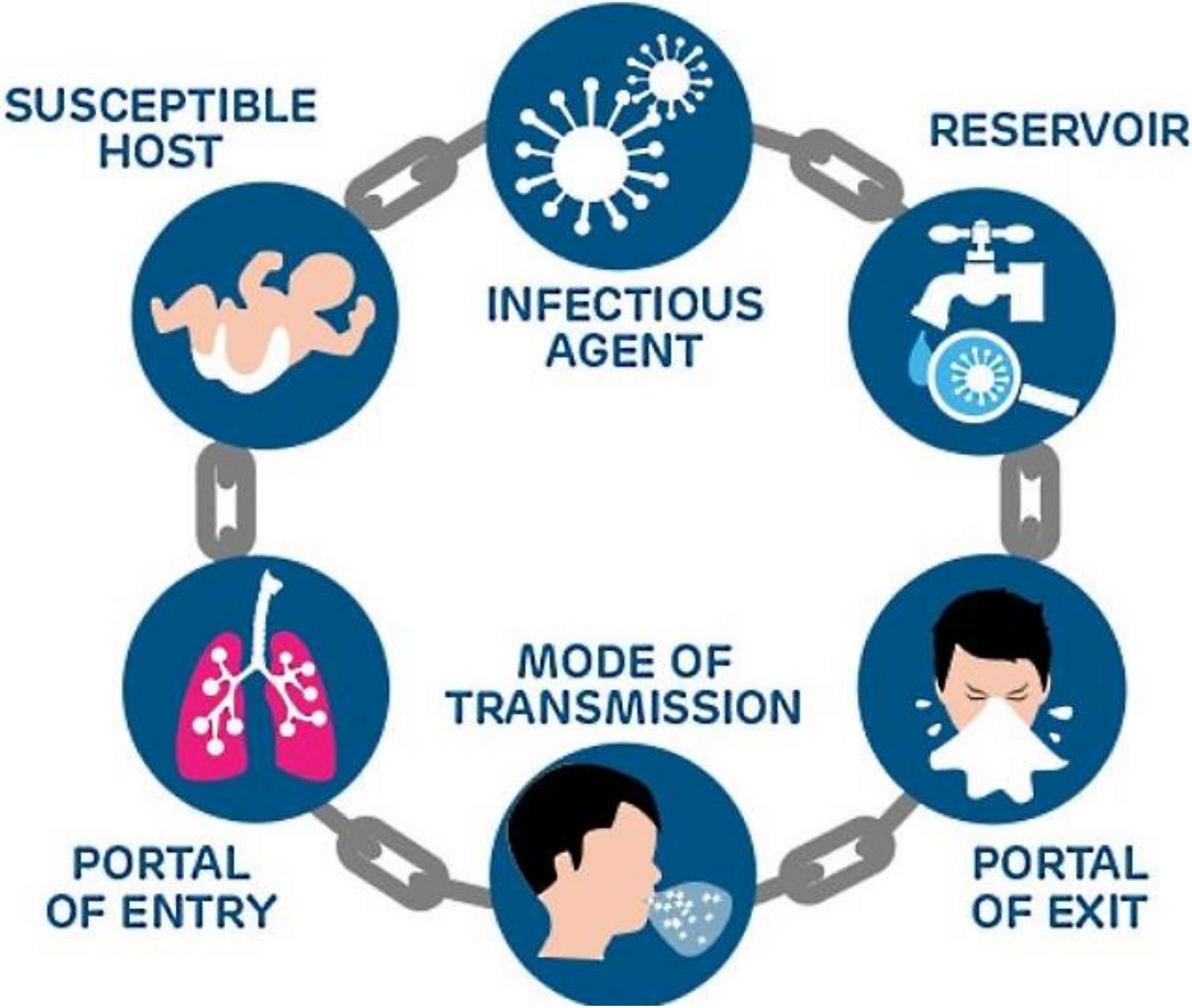
Streptococcus pneumoniae

Challenges

1. Widespread overuse of antibiotics
2. **Spread** of resistant strains
3. Underuse of the **vaccine** (PPSV23) recommended for adults at increased risk
4. Lack of adoption by some **clinical laboratories of standard** methods (NCCLS guidelines) for identifying and defining DRSP
5. Lack of **vaccine** availability to protect against all strains of pneumococcus



1.Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; eighteenth informational supplement. CLSI document M100-S18. Wayne, P Standards Institute; 2008.
2.Centers for Disease Control and Prevention. 2015. Active Bacterial Core Surveillance Report, Emerging Infections Program Network, *Streptococcus pneumoniae*, 2015.
3.Centers for Disease Control and Prevention. Antibiotic Resistance Threats in the United States, 2013.
4.Kim L, McGee L, Tomczyk S, Beall B. Biological and epidemiological features of antibiotic-resistance *Streptococcus pneumoniae* in pre- and post-conjugate vaccine eras: A United S perspectiveExternal. *Clin Microbiol Rev*. 2016;29(3):525–52.

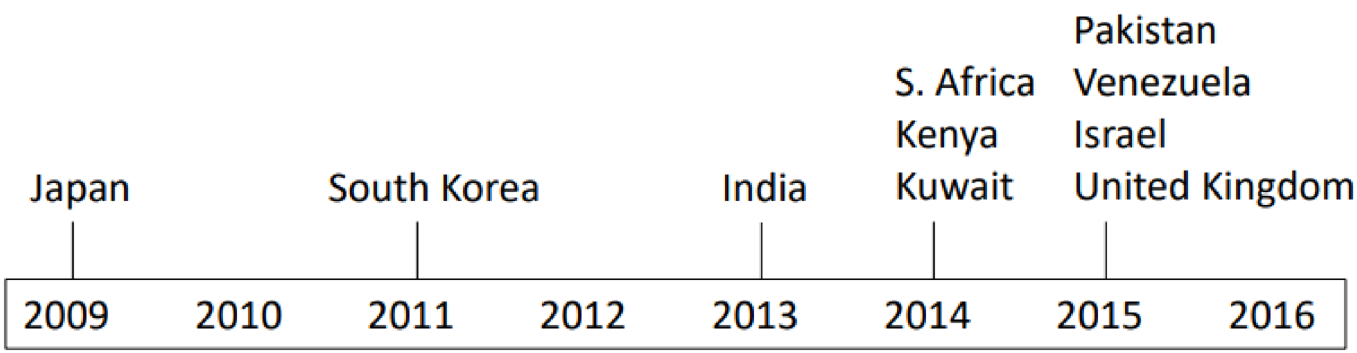

SUSCEPTIBLE HOST
INFECTIOUS AGENT
RESERVOIR
PORTAL OF ENTRY
MODE OF TRANSMISSION
PORTAL OF EXIT

- ❑ Detect

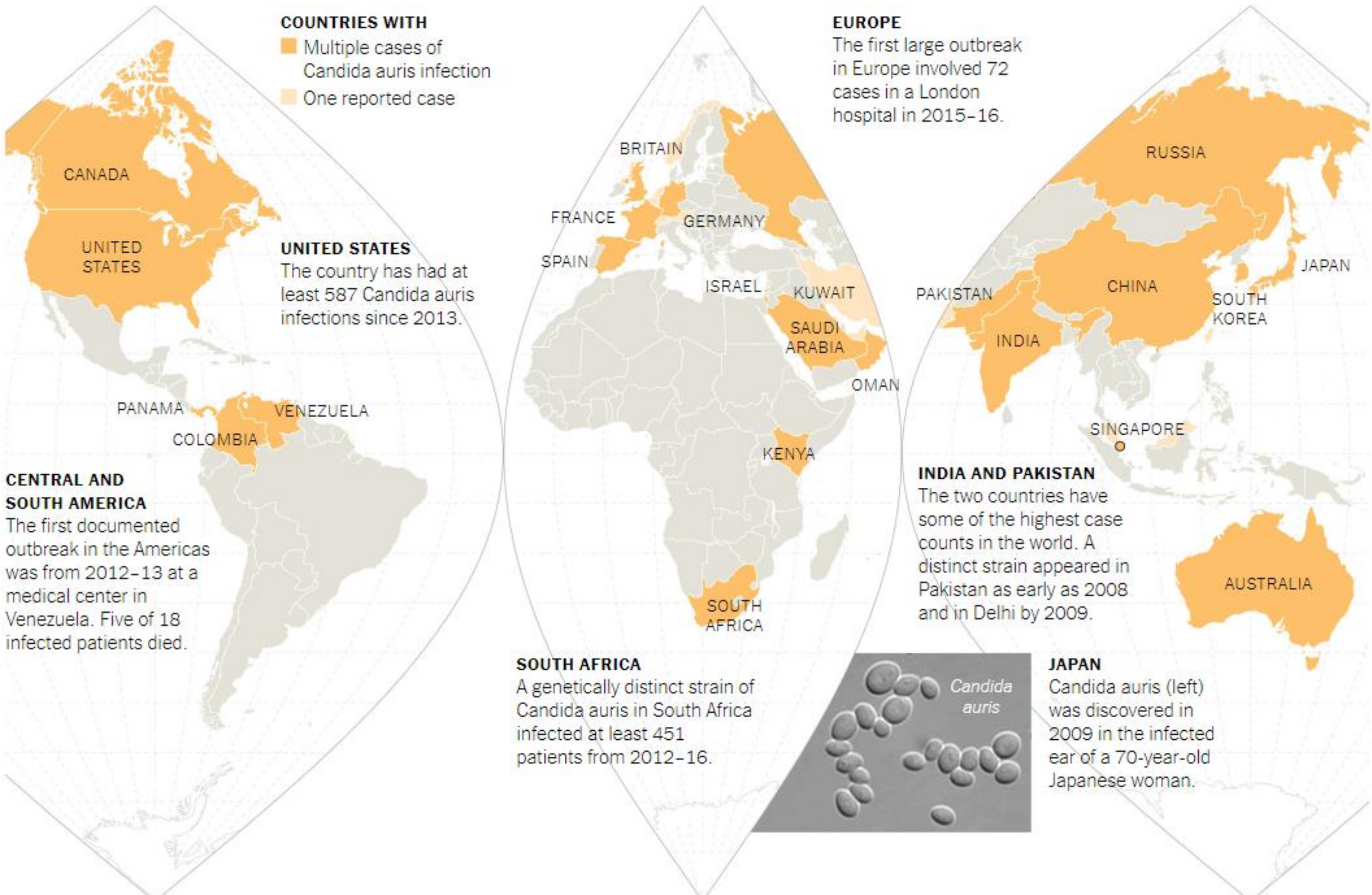
- ❑ Protect

C.Auris

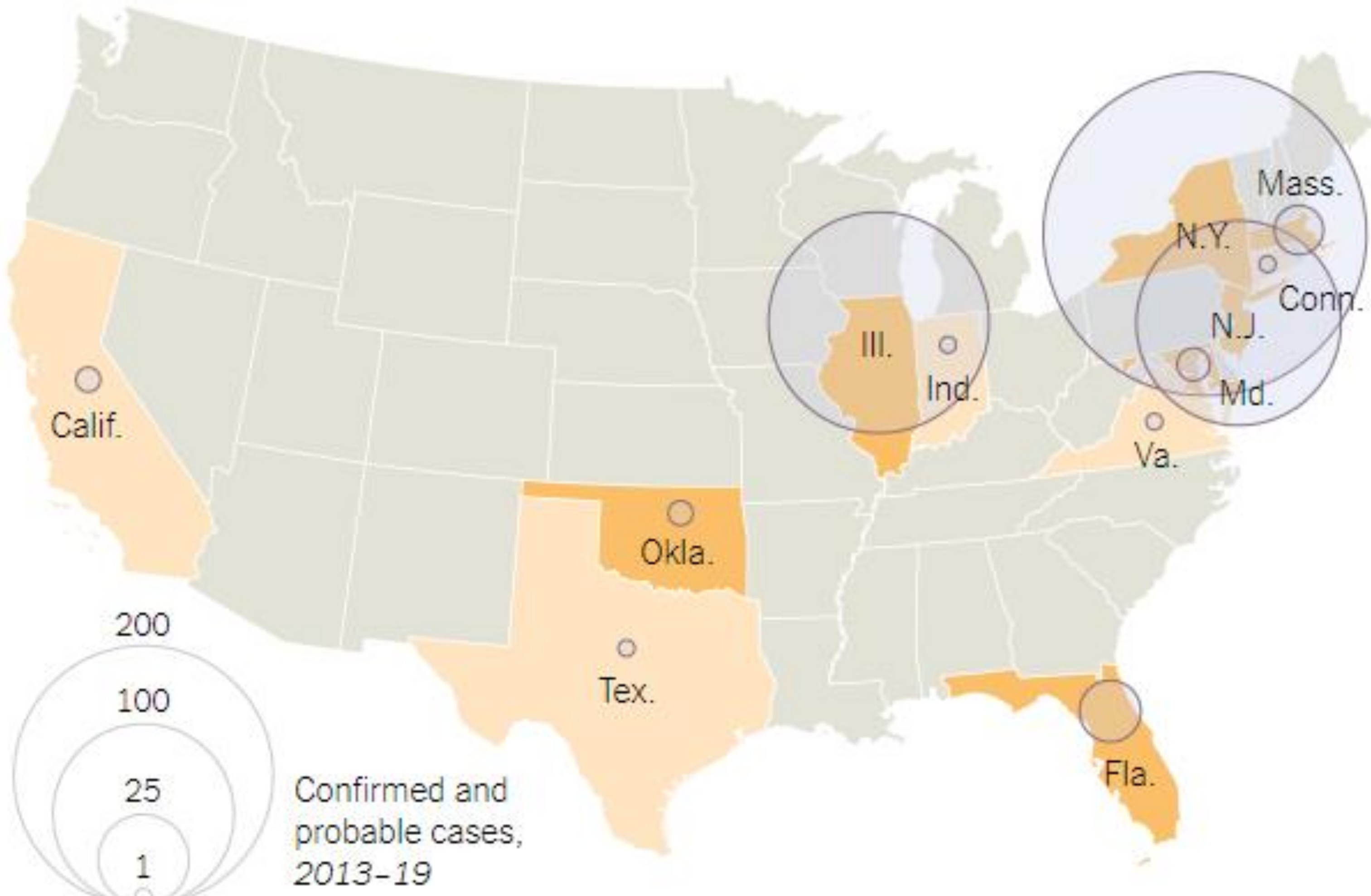
Rapid Emergence Since 2009



NEW YORK STATE OF OPPORTUNITY. Department of Health



By The New York Times | Sources: Centers for Disease Control and Prevention; Emerging Infectious Diseases; Emerging Microbes & Infections; Clinical Infectious Diseases; Journal of Infection; Mycoses; Doherty Institute. Image from Kazuo Satoh et al., Microbiology and Immunology



By The New York Times | Source: Centers for Disease Control and Prevention

Public Health Ontario | Santé publique Ontario

Interim Guide for Infection Prevention and Control of *Candida auris*

January 2019

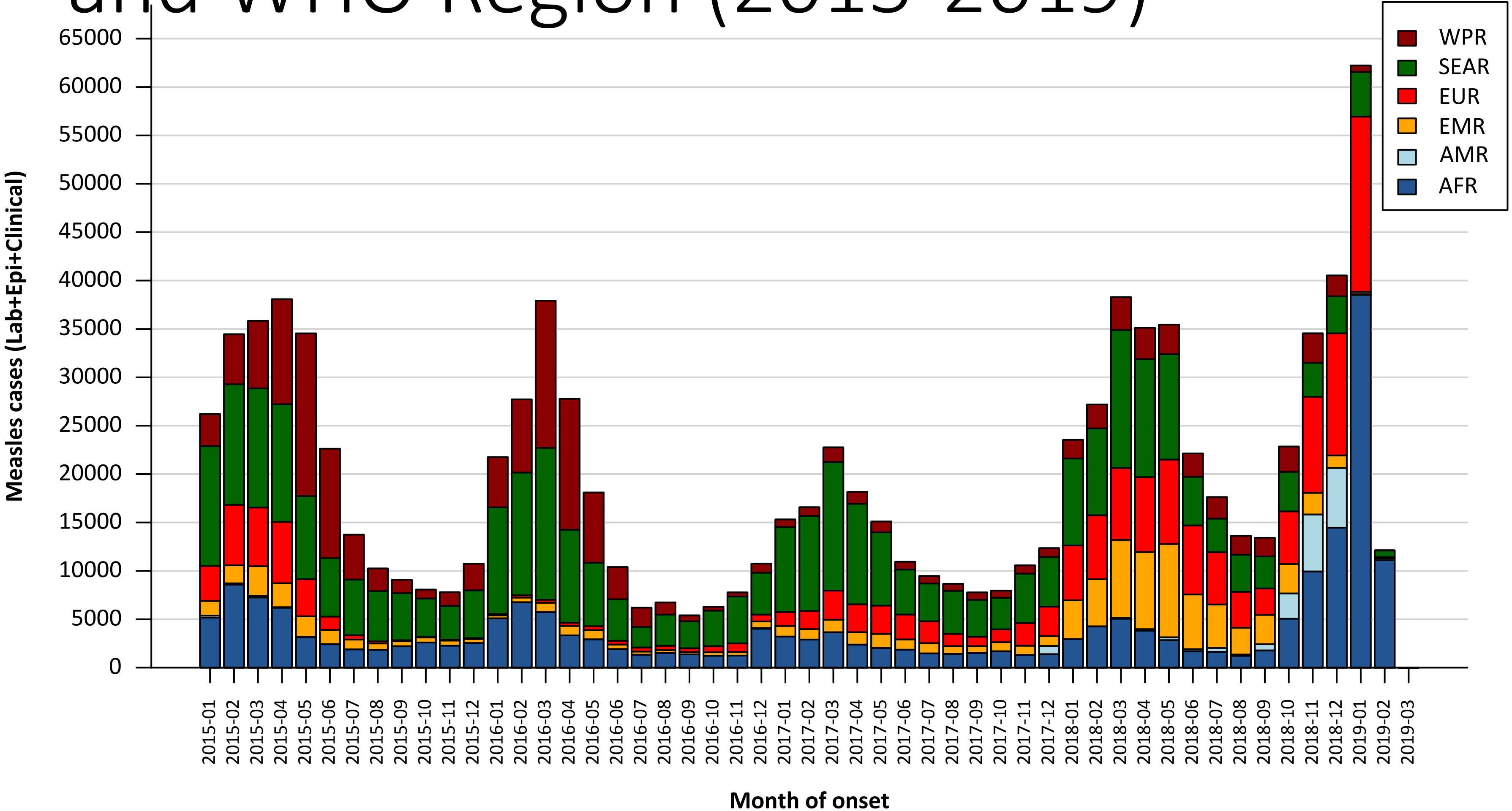
PIDAC | Provincial Infectious Diseases Advisory Committee

Infection Prevention and Control

- ❑ Detect
- ❑ Protect

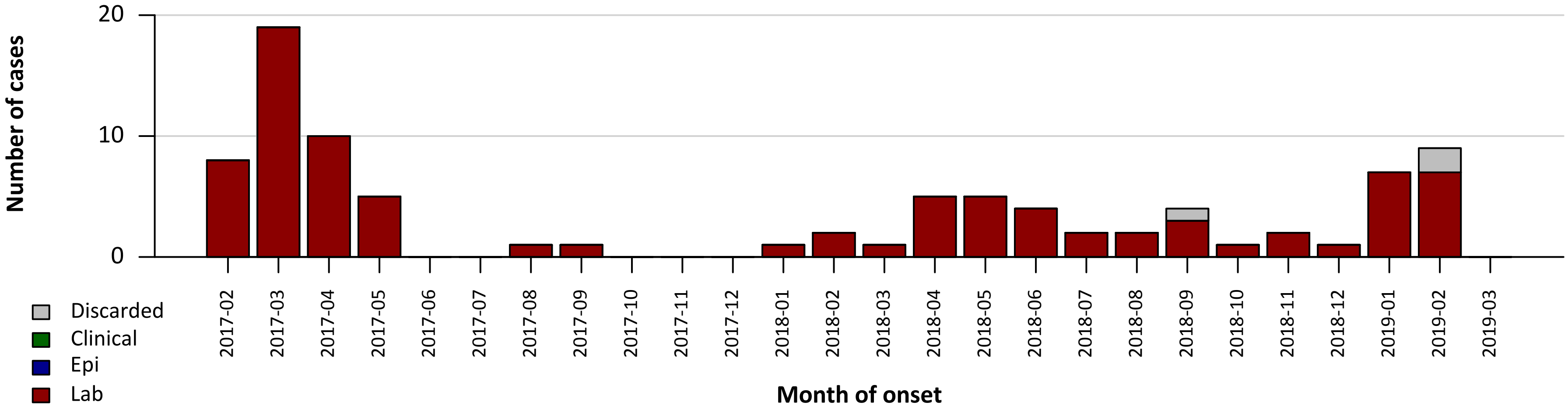
Honorable Mention and Timely

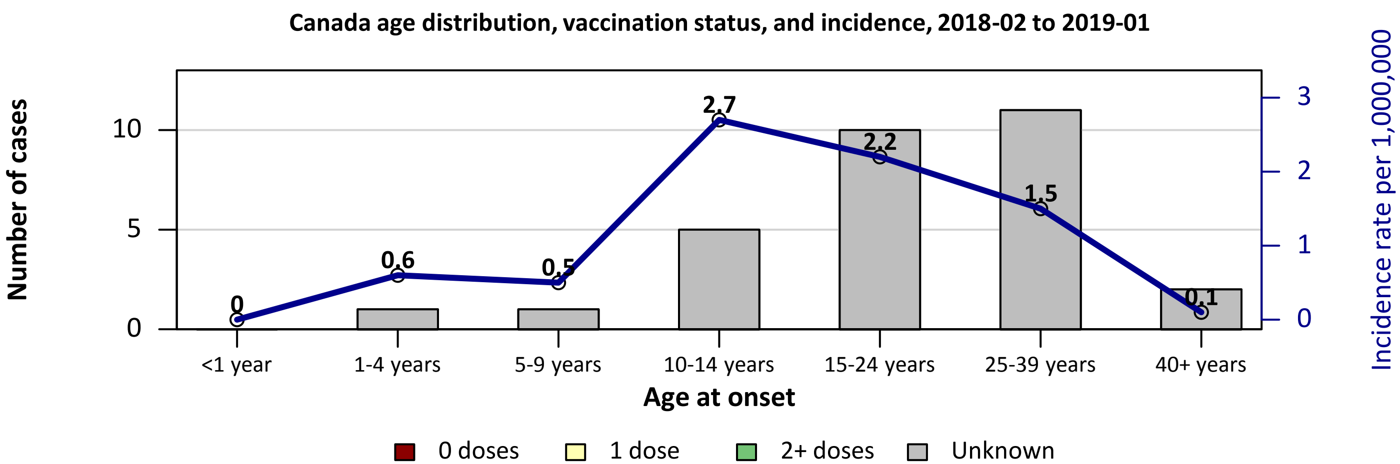
Measles case distribution by month and WHO Region (2015-2019)



Notes: Based on data received 2019-03 - Data Source: IVB Database - This is surveillance data, hence for the last month(s), the data may be incomplete.

Measles cases: Canada





Year	Confirmed Cases
2008	62
2009	14
2010	99
2012	9
2013	83
2014	418
2015	196
2016	11
2017	45
2018	29
2019	14

❑Detect

❑Protect

Cases of Acute Flaccid Paralysis detected in Canada between January 1, 2018 to present

AFM is a type of acute flaccid paralysis, or AFP. Canada monitors for cases of AFP as a part the World Health Organization surveillance efforts. On average, there are between 27-51 cases of AFP reported annually in Canada.

As of 03/06/2019

Cases Being Investigated	Confirmed Cases	Total cases
28	49	77

WHEN MEDICAL EQUIPMENT TRAVELS

Clinical Infectious Diseases

REVIEW ARTICLE

Mycobacterium chimaera Infections Associated With Contaminated Heater-Cooler Devices for Cardiac Surgery: Outbreak Management

Alexandre R. Marra,[1,2] Daniel J. Diekema,[1,3,4] and Michael B. Edmond[1,4]

Infection Control & Hospital Epidemiology (2019), **40**, 171–177
doi:10.1017/ice.2018.319

SHEA

Original Article

Molecular analysis of bacterial contamination on stethoscopes in an intensive care unit

Vincent R. Knecht[1], John E. McGinniss[1], Hari M. Shankar[1], Erik L. Clarke[2], Brendan J. Kelly[3], Ize Imai[1], Ayannah S. Fitzgerald[1], Kyle Bittinger[4,5], Frederic D. Bushman PhD[2] and Ronald G. Collman[1,2]

[1]Pulmonary, Allergy and Critical Care Division, Department of Medicine, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania, [2]Department of Microbiology, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania, [3]Division of Infectious Diseases, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania, [4]Department of Pediatrics, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania and [5]The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania

- ❑ Detect
- ❑ Protect

- ❑ Detect
- ❑ Protect

CPE in DRAINS

Clinical Infectious Diseases

REVIEW ARTICLE

IDSA Infectious Diseases Society of America hivma hiv medicine association OXFORD

The Hospital Water Environment as a Reservoir for Carbapenem-Resistant Organisms Causing Hospital-Acquired Infections—A Systematic Review of the Literature

Alice E. Kizny Gordon,[1] Amy J. Mathers,[3] Elaine Y. L. Cheong,[4,5] Thomas Gottlieb,[4,5] Shireen Kotay,[3] A. Sarah Walker,[1,2] Timothy E. A. Peto,[1,2] Derrick W. Crook[1,2] and Nicole Stoesser[1]

[1]Modernising Medical Microbiology Consortium, Nuffield Department of Medicine, John Radcliffe Hospital, University of Oxford, and [2]Oxford Biomedical Research Centre, United Kingdom; [3]Division of Infectious Diseases and International Health, Department of Medicine, University of Virginia Health System, Charlottesville; [4]Department of Microbiology & Infectious Diseases, Concord Repatriation Hospital, Sydney, and [5]University of Sydney, Australia

Over the last 20 years there have been 32 reports of carbapenem-resistant organisms in the hospital water environment, with half of these occurring since 2010. The majority of these reports have described associated clinical outbreaks in the intensive care setting, affecting the critically ill and the immunocompromised. Drains, sinks, and faucets were most frequently colonized, and *Pseudomonas aeruginosa* the predominant organism. Imipenemase (IMP), *Klebsiella pneumoniae* carbapenemase (KPC), and Verona integron-encoded metallo-β-lactamase (VIM) were the most common carbapenemases found. Molecular typing was performed in almost all studies, with pulse field gel electrophoresis being most commonly used. Seventy-two percent of studies reported controlling outbreaks, of which just more than one-third eliminated the organism from the water environment. A combination of interventions seems to be most successful, including reinforcement of general infection control measures, alongside chemical disinfection. The most appropriate disinfection method remains unclear, however, and it is likely that replacement of colonized water reservoirs may be required for long-term clearance.

Keywords. carbapenem-resistant; carbapenemase; healthcare-associated infections; outbreak; water.

CPE All over the place

Table 2. Water Reservoirs Containing Carbapenem-Resistant Organisms[a]

Water Reservoir	Studies, No. (N = 32)	References
Drains/drainage systems	17	Peña et al [35], Kotsanas et al [26], La Forgia et al [28], Betteridge et al [7], Leitner et al [20], Wendel et al [29], Breathnach et al [21], Leung et al [24], Snitkin et al [22], Tofteland et al [32], Vergara-López et al [33], Yomoda et al [9], Stjarne Aspelund et al [12], Odom et al [11], Knoester et al [25], Landelle et al [37], Seara et al [34]
Sink surfaces	14	Betteridge et al [7], Wendel et al [29], Knoester et al [25], Podnos et al [23], Wang et al [27], Biswal et al [8], Hong et al [30], Bukholm et al [31], Kouda et al [38], Landelle et al [37], Dewi et al [10], Kaiser et al [13], Ito et al [14], Leung et al [24]
Faucets	8	Odom et al [11], Knoester et al [25], Majumdar et al [17], Pitten et al [36], Hong et al [30], Bukholm et al [31], Alter et al [15], Leung et al [24]
Water	3	Knoester et al [25], Ambrogi et al [18], Bukholm et al [31]
Inflatable hair wash basin	2	Wendel et al [29], Knoester et al [25]
Sensor mixer taps	1	Durojaiye et al [16]
Water/tea dispenser	2	Wong et al [19], Ito et al [14]
Shower/shower equipment	3	Betteridge et al [7], Leung et al [24], Seara et al [34]
Toilet bowl/brush	2	Breathnach et al [21], Kouda et al [38]

[a]Some studies had multiple water reservoirs, so categories are not mutually exclusive.

AMERICAN SOCIETY FOR MICROBIOLOGY Applied and Environmental Microbiology®

Check for updates

Spread from the Sink to the Patient: *In Situ* Study Using Green Fluorescent Protein (GFP)-Expressing *Escherichia coli* To Model Bacterial Dispersion from Hand-Washing Sink-Trap Reservoirs

Shireen Kotay,[a] Weidong Chai,[a] William Guilford,[b] Katie Barry,[a] Amy J. Mathers[a,c]
Division of Infectious Diseases and International Health, Department of Medicine, University of Virginia Health System, Charlottesville, Virginia, USA[a]; Department of Biomedical Engineering, University of Virginia, Charlottesville, Virginia, USA[b]; Clinical Microbiology, Department of Pathology, University of Virginia Health System, Charlottesville, Virginia, USA[c]

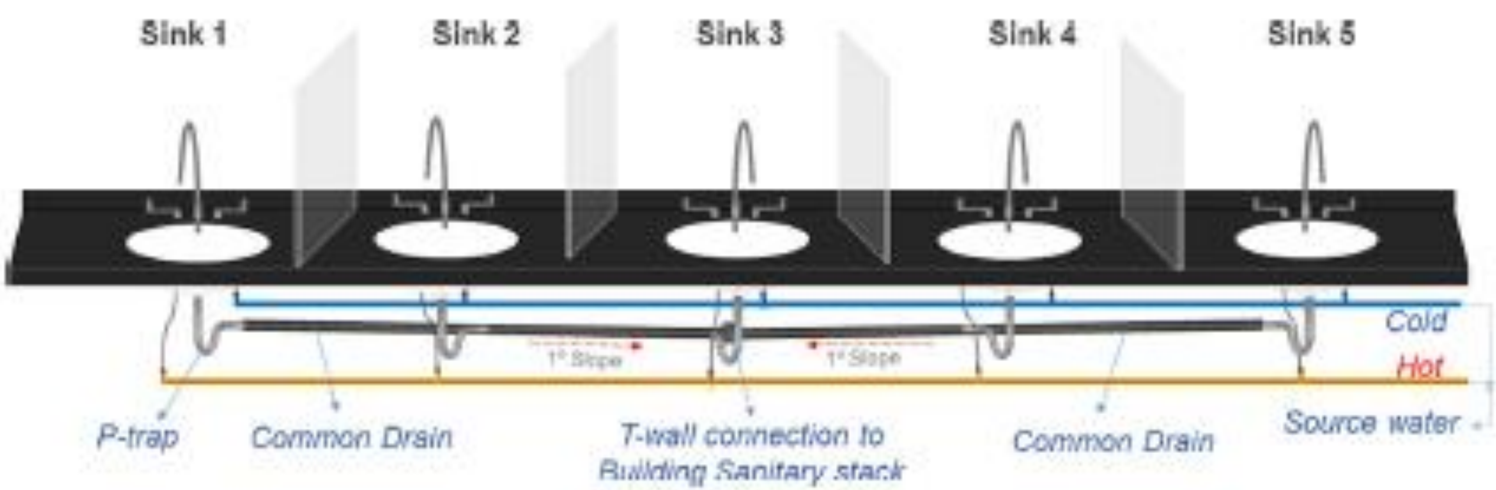


FIG 4 Layout of the sink gallery comprising the 5 sink modules and the associated plumbing.

AMERICAN SOCIETY FOR MICROBIOLOGY | Applied and Environmental Microbiology®

Spread from the Sink to the Patient: *In Situ* Study Using Green Fluorescent Protein (GFP)-Expressing *Escherichia coli* To Model Bacterial Dispersion from Hand-Washing Sink-Trap Reservoirs

Shireen Kotay,[a] Weidong Chai,[a] William Guilford,[b] Katie Barry,[a] Amy J. Mathers[a,c]

Division of Infectious Diseases and International Health, Department of Medicine, University of Virginia Health System, Charlottesville, Virginia, USA[a]; Department of Biomedical Engineering, University of Virginia, Charlottesville, Virginia, USA[b]; Clinical Microbiology, Department of Pathology, University of Virginia Health System, Charlottesville, Virginia, USA[c]

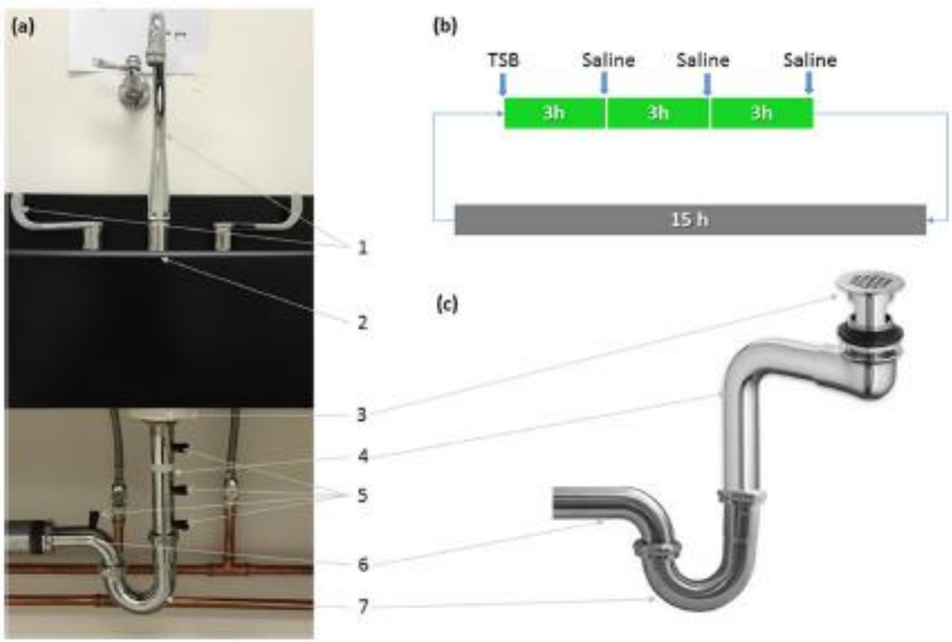


FIG 5 (a) Parts of the sink drain line: 1, faucet and handles; 2, sink counter; 3, strainer; 4, tailpipe; 5, sampling ports; 6, trap arm; 7, P-trap. (b and c) Schematic of the nutrient regimen (b) and offset drain tailpiece used for dispersion experiments (c).

American Society for Microbiology | Applied and Environmental Microbiology®
PUBLIC AND ENVIRONMENTAL HEALTH MICROBIOLOGY

Spread from the Sink to the Patient: *In Situ* Study Using Green Fluorescent Protein (GFP)-Expressing *Escherichia coli* To Model Bacterial Dispersion from Hand-Washing Sink-Trap Reservoirs

Shireen Kotay,[a] Weidong Chai,[a] William Guilford,[b] Katie Barry,[a] Amy J. Mathers[a,c]
Division of Infectious Diseases and International Health, Department of Medicine, University of Virginia Health System, Charlottesville, Virginia, USA[a]; Department of Biomedical Engineering, University of Virginia, Charlottesville, Virginia, USA[b]; Clinical Microbiology, Department of Pathology, University of Virginia Health System, Charlottesville, Virginia, USA[c]

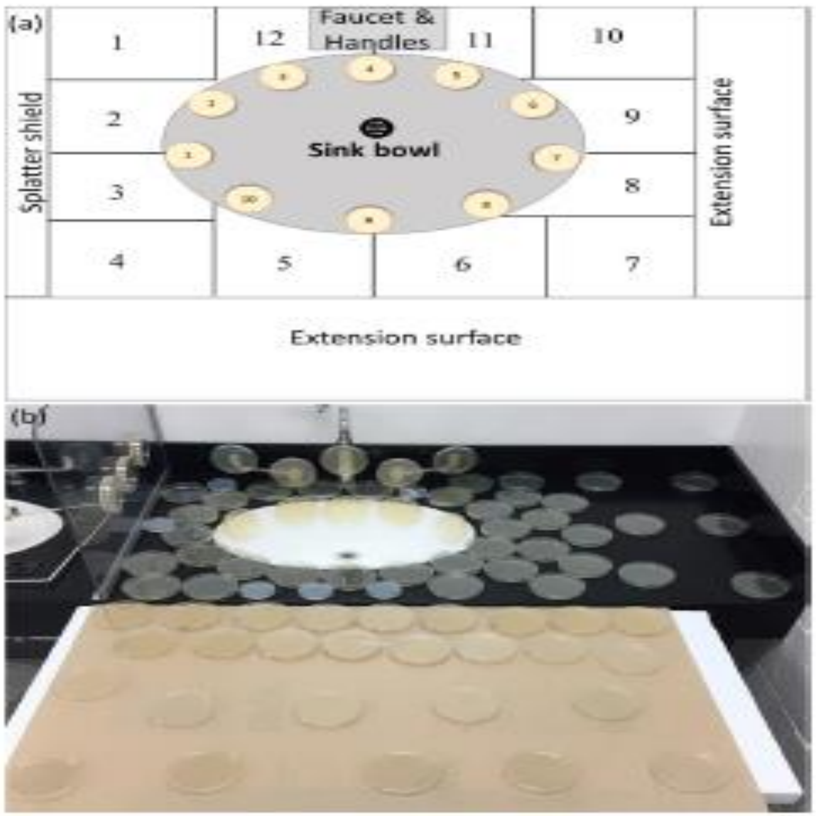


FIG 6 (a) Layout of the zones of the sink counter, bowl, and extension surface designated to monitor droplet dispersion and (b) layout of the TSA plates used for GFP-expressing *E. coli* droplet dispersion on the surfaces surrounding the sink.

American Journal of Infection Control 47 (2019) 98–100

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Brief Report

The relevance of sink proximity to toilets on the detection of *Klebsiella pneumoniae* carbapenemase inside sink drains

Blake W. Buchan PhD, D(ABMM)[a,*], Mary Beth Graham MD[b], Jill Lindmair-Snell RN, MSN, CIC[d], Jennifer Arvan BSN, RN[d], Nathan A. Ledeboer PhD, D(ABMM)[a], Rahul Nanchal MD[c], L. Silvia Munoz-Price MD, PhD[b]

[a] Department, of Pathology, The Medical College of Wisconsin, Milwaukee, WI
[b] Division of Infectious Diseases, The Medical College of Wisconsin, Milwaukee, WI
[c] Division of Pulmonary and Critical Care Medicine, The Medical College of Wisconsin, Milwaukee, WI
[d] Froedtert Memorial Lutheran Hospital, Milwaukee, WI

OUTSIDE THE HOSPITAL

Public Health Notices

Active Health Investigations

Currently in effect

Food-related outbreaks

Outbreak of Salmonella infections – (NEW) – April 5, 2019

▶ Salmonella investigation overview (as of April 5, 2019)

Outbreaks of Salmonella infections linked to raw chicken, including frozen raw breaded chicken products - (update) - March 22, 2019

▶ Salmonella investigations overview (as of March 22, 2019)

Outbreak of Salmonella infections linked to raw turkey and raw chicken - (update) - January 31, 2019

▶ Salmonella investigation overview (as of January 31, 2019)

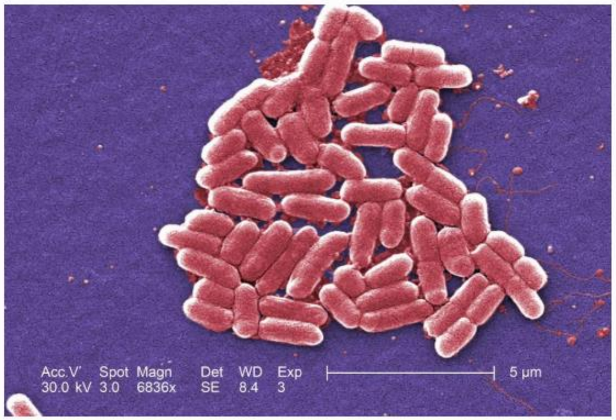
Antibiotic resistant and blood-borne infections

- Information for Canadians who have received or are considering medical procedures in Mexico - February 13, 2019

9,421 views | Apr 5, 2019, 10:33pm

72 People Ill From E. Coli Outbreak, What Is The Cause?

Bruce Y. Lee Contributor
Healthcare



HEALTH April 5, 2019 11:34 pm Updated: April 6, 2019 2:31 pm

Salmonella outbreak sees 63 cases in 6 Canadian provinces — but no one knows how it started yet

By Jesse Ferreras
Online Journalist Global News

Public Health Agency of Canada says 63 sick following salmonella outbreak in 6 provinces

- ❑ Detect
- ❑ Protect

PUBLIC HEALTH INSIGHT

Addressing the rising rates of gonorrhea and drug-resistant gonorrhea: There is no time like the present

M Bodie[1]*,

Table 1: Four key recommendations needed to preserve options for remaining first-line treatment of antimicrobial resistant gonorrhea

Recommendations	Details
Normalize and increase screening and promote safer sex practices	• To reduce barriers and associated stigma, look for opportunities during routine medical care to have a conversation about STI risks, safer sex practices and the benefits of screening • Samples should be taken from all sites of exposure, to increase diagnosis and ensure appropriate treatment is provided
Conduct pretravel counselling Include a travel history in your risk assessment	• Counsel travellers on the importance of safer sex practices while travelling; depending on the destination, it may be appropriate to discuss the risk of AMR-GC infection specifically • If there is a history of unprotected sexual exposure during travel, maintain a heightened index of suspicion for potential AMR-GC infection, and more specifically, a globally emerging resistant strain not currently circulating in Canada
Increase the use of cultures for diagnosis and test-of-cure	• NAAT is convenient and highly sensitive and can increase the diagnosis of GC. Culture provides information on antimicrobial susceptibilities prior to treatment and is critical for improved public health monitoring of antimicrobial resistance patterns and trends • When signs and/or symptoms are consistent with gonococcal infection, the use of culture along with NAAT is extremely important
Provide up-to-date combination therapy for patients and their contacts	• Due to increasing antimicrobial resistance, combination therapy is the standard of care choice of combination therapy should be guided by infection site and patient history. AMR resistance patterns may show regional variation • Consult the CGSTI or your jurisdiction's STI guidance for details on treatment recommendations • Treatment of all sexual contacts from the previous 60 days is essential. Local public health professionals can assist with contact tracing and notification as needed

Abbreviations: AMR, antimicrobial resistance; CGSTI, Canadian Guidelines on Sexually Transmitted Infections (4); GC, gonococcal; NAAT, nucleic acid amplification testing; STI, sexually transmitted infection

Bodie M, Gale-Rowe M, Alexandre S, Auguste U, Tomas K, Martin I. Addressing the rising rates of gonorrhea and drug resistant gonorrhea: There's no time like the present. Can Commun Dis Rep 2019;45(2/3):54–62. https://doi.org/10.14745/ccdr.v45i23a02

HEALTHCARE®

Clinical Infectious Diseases

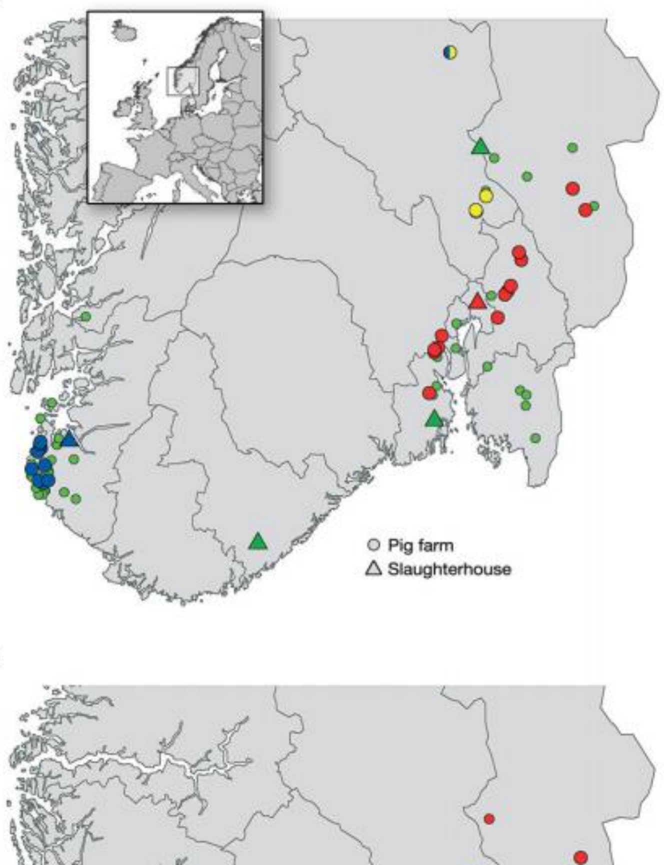
MAJOR ARTICLE

IDSA Infectious Diseases Society of America hivma hiv medicine association OXFORD

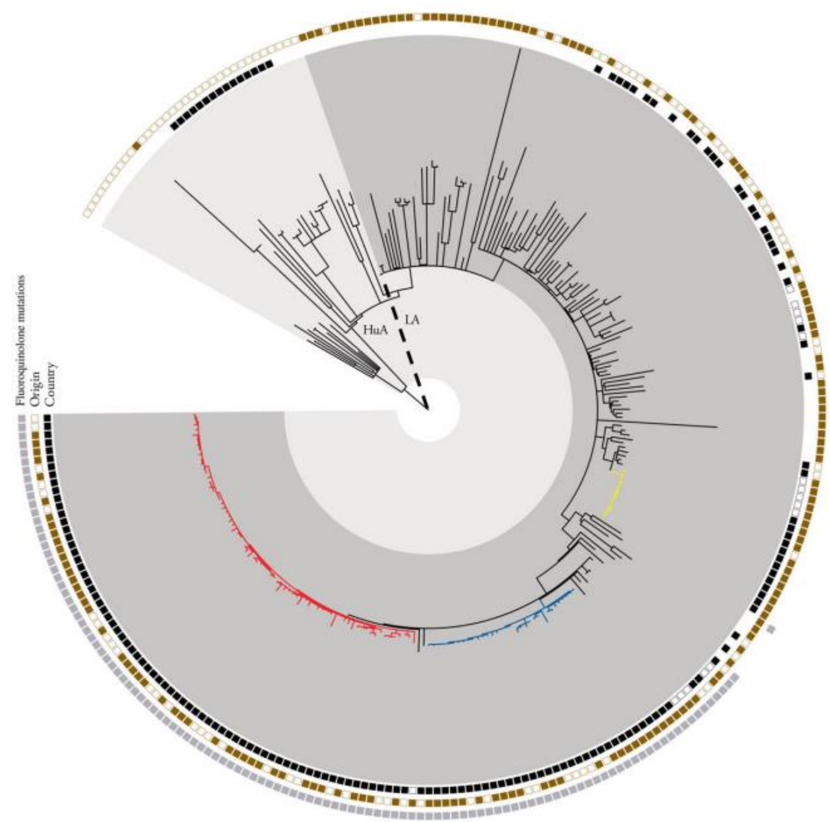
Methicillin-Resistant *Staphylococcus aureus* CC398 in Humans and Pigs in Norway: A "One Health" Perspective on Introduction and Transmission

Carl Andreas Grøntvedt,[1,a] Petter Elstrøm,[2,a] Marc Stegger,[5,6] Robert Leo Skov,[5] Paal Skytt Andersen,[5,6] Kjersti Wik Larssen,[3] Anne Margrete Urdahl,[1] Øystein Angen,[1,5] Jesper Larsen,[5] Solfrid Åmdal,[4] Siri Margrete Løtvedt,[4] Marianne Sunde,[1,2,b] and Jørgen Vildershøj Bjørnholt[2,b]

A



B



Clinical Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America

hivma hiv medicine association

OXFORD

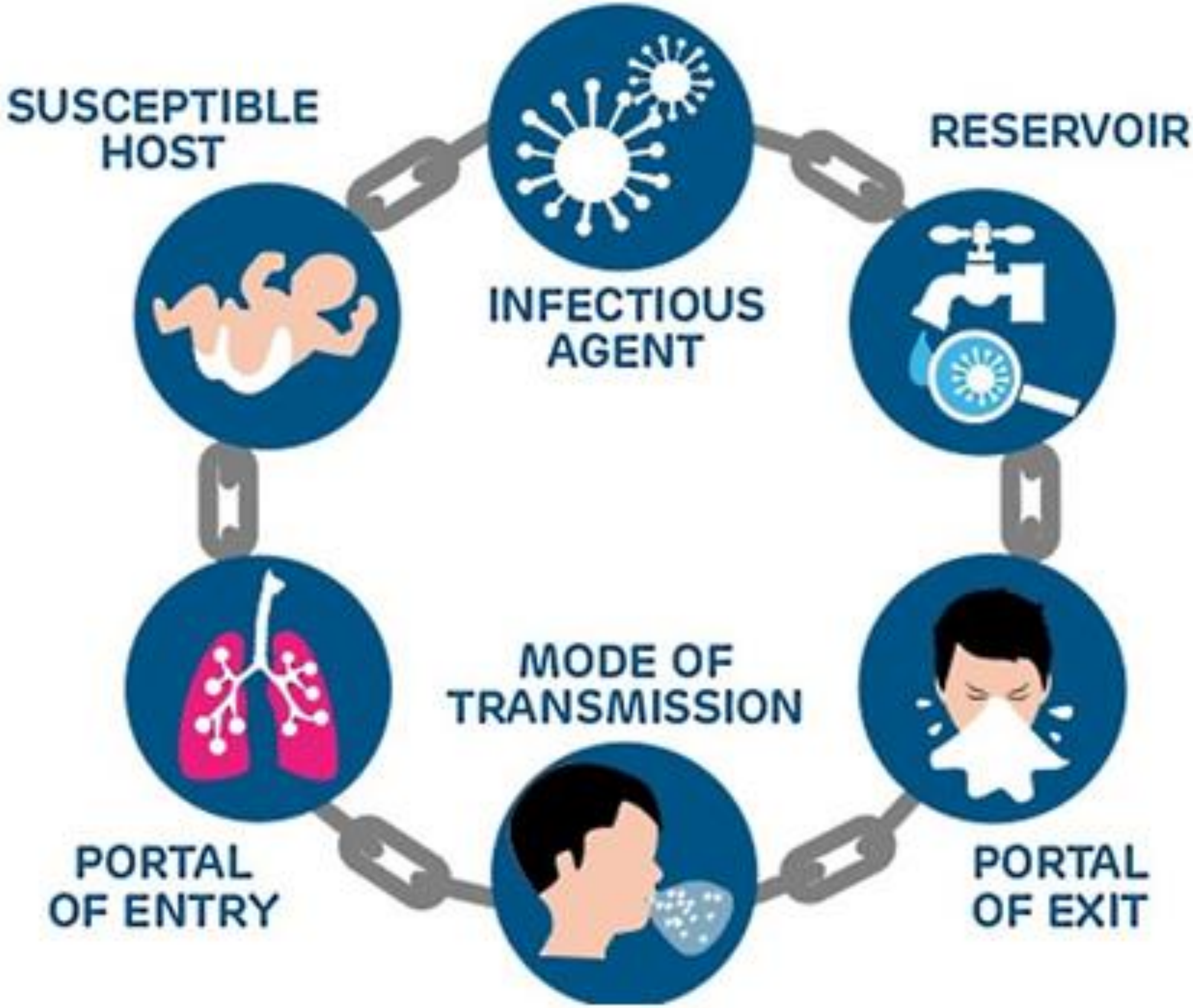
(

Methicillin-Resistant *Staphylococcus aureus* CC398 in Humans and Pigs in Norway: A "One Health" Perspective on Introduction and Transmission

Carl Andreas Grøntvedt,[1,a] Petter Elstrøm,[2,a] Marc Stegger,[5,6] Robert Leo Skov,[5] Paal Skytt Andersen,[5,6] Kjersti Wik Larssen,[3] Anne Margrete Urdahl,[1] Øystein Angen,[1,5] Jesper Larsen,[5] Solfrid Åmdal,[4] Siri Margrete Løtvedt,[4] Marianne Sunde,[1,2,b] and Jørgen Vildershøj Bjørnholt[2,b]

- Human occupational exposure, trade of pigs and livestock transport vehicles. These findings are essential for keeping pig populations MRSA free and, from a "One Health" perspective, preventing pig farms from becoming reservoirs for MRSA transmission to humans.

The Future successful ICP


SUSCEPTIBLE HOST
INFECTIOUS AGENT
RESERVOIR
PORTAL OF EXIT
MODE OF TRANSMISSION
PORTAL OF ENTRY

BMJ Quality & Safety Online First, published on 5 July 2017 as 10.1136/bmjqs-2017-006793

VIEWPOINT

Advancing infection prevention and antimicrobial stewardship through improvement science

Jerome A Leis[1,2,3]

The role of the infection preventionist in a transformed healthcare system: Meeting healthcare needs in the 21st century

Katrina Crist, MBA, CAE[a,*], Denise Murphy, RN, BSN, MPH, CIC, FAPIC, CPPS, FAAN[b], Marc-Oliver Wright, MT (ASCP), MS, CIC, FAPIC[c], Elizabeth Wallace, MPH, CIC, FAPIC[d], Mary Lou Manning, PhD, CRNP, CIC, FAPIC, FAAN[e]

APIC Consensus Conference - AJIC Paper

Curr Infect Dis Rep (2016) 18: 16
DOI 10.1007/s11908-016-0523-z

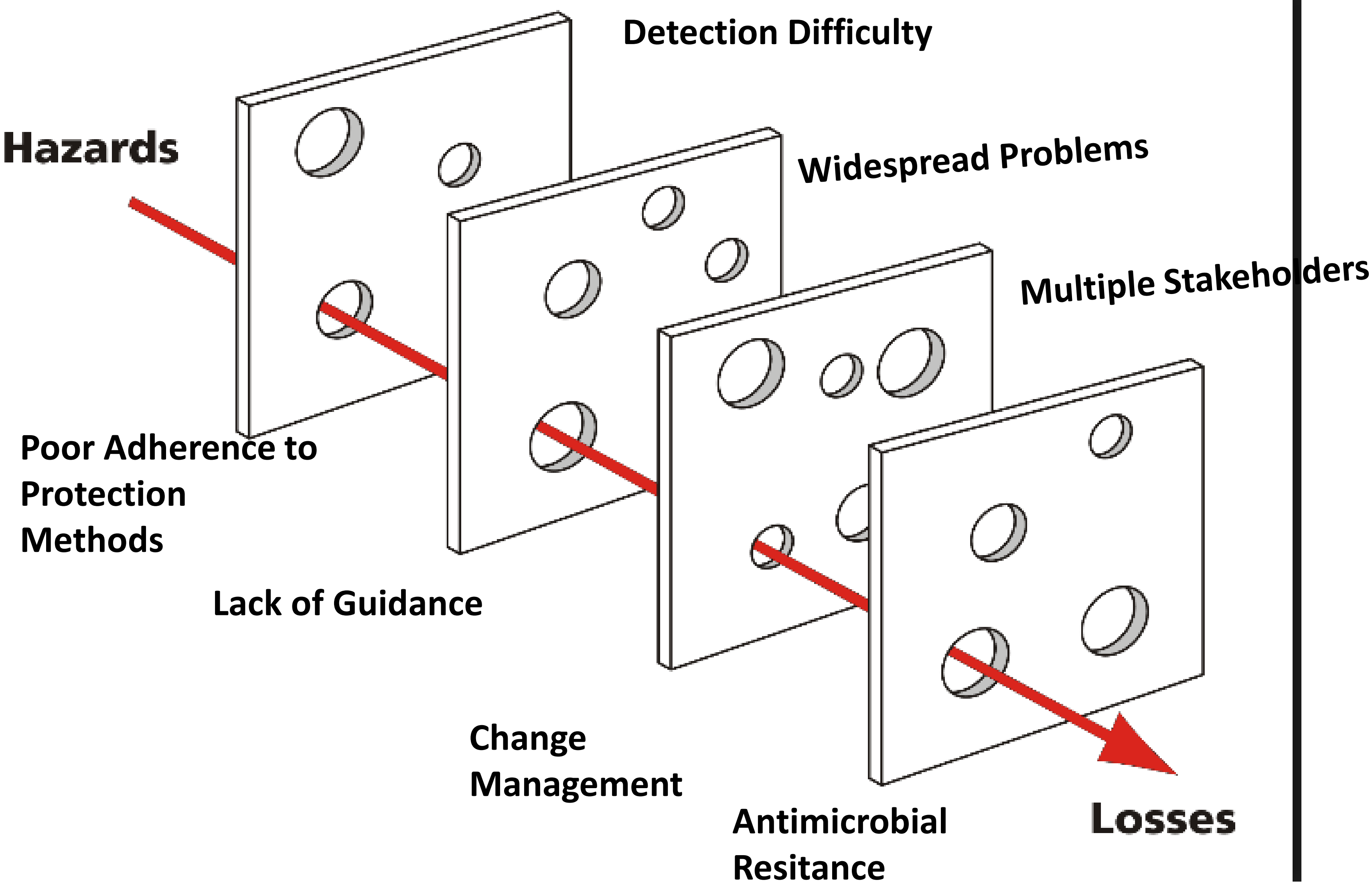
HEALTHCARE ASSOCIATED INFECTIONS (G BEARMAN AND D MORGAN, SECTION EDITORS)

Infection Prevention in the Hospital from Past to Present: Evolving Roles and Shifting Priorities

Michelle Doll[1] · Angela L. Hewlett[2] · Gonzalo Bearman[3]


Animal Disease
One Health
Human Disease
Environment

Recap of Challenges




THANK
YOU
FOR
ALL YOU
DO

Thank You

References

- Lund, B. M., & Peck, M. W. (2015). A Possible Route for Foodborne Transmission of Clostridium difficile? Foodborne Pathogens and Disease, 12(3), 177–182. http://doi.org/10.1089/fpd.2014.1842
- McDonald LC, Coignard B, Dubberke E, et al. Ad Hoc CDAD Surveillance Working Group. Recommendations for surveillance of Clostridium difficile-associated disease. Infect Control Hosp Epidemiol 2007; 28:140-5
- SHEA/IDSA Compendium of Recommendations. Infect Control Hosp Epidemiol 2008;29:S81–S92. http://www.journals.uchicago.edu/doi/full/10.1086/59106 5
- Nagaraja, Aarathi et al. Clostridium difficile infections before and during use of ultraviolet disinfection American Journal of Infection Control , Volume 43 , Issue 9 , 940 - 945
- Reveles, K. R., Lee, G. C., Boyd, N. K. & Frel, C. R. (2014). The rise in Clostridium difficile Infection incidence among hospitalized adults in the United States: 2001-2010. American Journal of Infection Control, 42, 1028-32
- David J. Weber William A. Rutala Deverick J. Anderson Luke F. Chen Emily E. Sickbert-Bennett John M. Boyce Effectiveness of ultraviolet devices and hydrogen peroxide systems for terminal room decontamination: Focus on clinical trials Authors Source Information May 2016, Volume44(Issue Supplement) Page p.e77To-e84
- Weber, D. J., Consoli, S. A., & Rutala, W. A. (2016). Occupational health risks associated with the use of germicides in health care. *AJIC: American Journal of Infection Control, 44*(Supplement), e85-e89. doi:10.1016/j.ajic.2015.11.030

References

- Aronhalt, Kimberly C., et al. "Patient and Environmental Service Employee Satisfaction of using Germicidal Bleach Wipes for Patient Room Cleaning." Journal for Healthcare Quality 35.6 (2013): 30-6. Web. 2 Oct. 2016
- Department of Health (2012) Updated Guidance on the Diagnosis and reporting of Clostridium Difficile
- Eyre, D.W., et al., Diverse sources of C. difficile infection identified on whole-genome sequencing. N Engl J Med, 2013. 369(13): p. 1195-205
- Guerrero, D.M., et al., Asymptomatic carriage of toxigenic Clostridium difficile by hospitalized patients. J Hosp Infect, 2013. 85(2): p. 155-8.
- Koll BS, Ruiz RE, Calfee DP, Jalon HS, Stricof RL, Adams A, et al. Prevention of hospital-onset Clostridium difficile infection in the New York metropolitan region using a collaborative intervention model. J Healthc Qual 2014;36:35- 45
- US EPA, Guidance for the Efficacy Evaluation of Products with Sporicidal Claims Against *Clostridium difficile (June 2014).* https://www.epa.gov/pesticide-registration/guidance-efficacy-evaluation-products-sporicidal-claims-against-clostridium
- Ontario Agency for Health Protection and Promotion, Provincial Infectious Diseases Advisory Committee. Annex C – Testing, Surveillance and Management of Clostridium difficile. Annexed to: Routine Practices and Additional Precautions in All Health Care Settings. Toronto, ON: Queen's Printer for Ontario; 2013
- Mitchell BG, Dancer SJ, Anderson A, Dehn E. Risk of organism acquisition from prior room occupants: a systematic review and meta-analysis. J Hosp Infect 2015;91:211–217.

References

- Rutala WA, Peacock JE, Gergen MF, Sobsey MD, Weber DJ. Efficacy of hospital germicides against adenovirus 8, a common cause of epidemic keratoconjunctivitis in health care facilities. Antimicrob Agents Chemother. 2006;50(4):1419-24.
- Campagna MV, Faure-Kumar E, Treger JA, et al. Factors in the Selection of Surface Disinfectants for Use in a Laboratory Animal Setting. *J Am Assoc Lab Anim Sci*. 2016;55(2):175-88.
- Adams, E., Quinn, M., Tsay, S., Poirot, E., Chaturvedi, S., Southwick, K....Workgroup, C. (2018). Candida auris in Healthcare Facilities, New York, USA, 2013–2017. Emerging Infectious Diseases, 24(10), 1816-1824. https://dx.doi.org/10.3201/eid2410.180649.
- Schwartz IS, Hammond GW. First reported case of multidrug-resistant Candida auris in Canada. Can Commun Dis Rep. 2017;43 (7/8):150-3. https://doi.org/10.14745/ccdr.v43i78a02

Spread of *mcr-1*–Driven Colistin Resistance on Hospital Surfaces, Italy

Elisabetta Caselli, Maria D'Accolti, Irene Soffritti, Micol Piffanelli, Sante Mazzacane

Author affiliation: Università Degli Studi di Ferrara, Ferrara, Italy

DOI: https://doi.org/10.3201/eid2409.171386

Plasmid-mediated colistin resistance driven by the *mcr-1* gene is of great clinical concern. Its diffusion in the hospital environment is unknown. We detected *mcr-1*–driven resistance in 8.3% of *Enterobacteriaceae* isolates from hospital surfaces in Italy, which might represent a reservoir of threatening nosocomial pathogens.

Our data show that *mcr-1*–carrying *Enterobacteriaceae* can be detected on hospital surfaces with higher frequency than in clinical isolates, indicating that this plasmid has the ability to spread, not only in vitro (*1*), in key human pathogens. Persistent surface contamination in hospitals might thus favor colistin resistance spread among gram-negative bacteria, perhaps helped by selective pressure exerted by some antiseptics (i.e., chlorhexidine) (*10*). Although this finding might represent a potential reservoir of threatening nosocomial pathogens and favor their diffusion in hospitalized patients, currently no specific monitoring exists to control it. Thus, we suggest that surveillance for *mcr-1*–driven colistin resistance might include not only clinical samples but also environmental analyses and all clinically relevant gram-negative species to control and counteract the increase of untreatable infections.

1