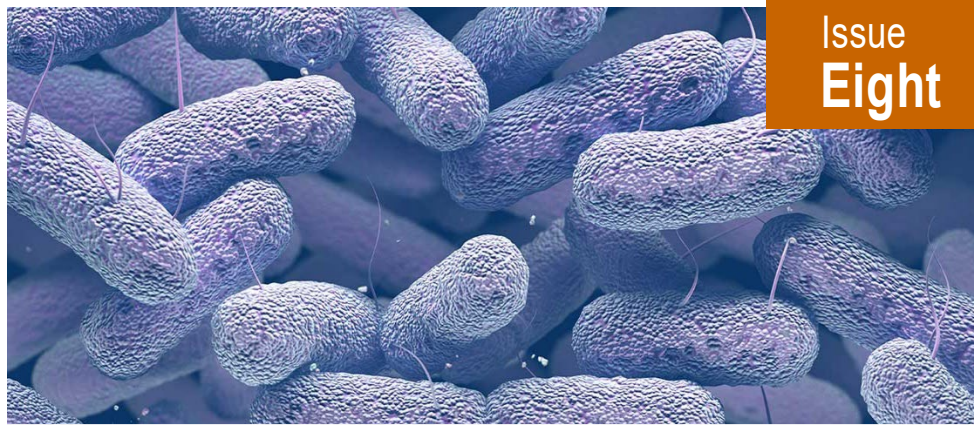


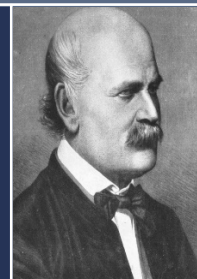
in this issue >>>

- Semmelweis Legacy
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- Staff Highlight
- Antimicrobial Resistance / Journal Club



A Quarterly Insight into Kansas Healthcare Associated Infections, Antimicrobial Resistance and Antibiotic Stewardship Efforts

Semmelweis Times



current topics >>>

Visit the HAI/AR Website for More Information and Resources

Our website is undergoing updates and upgrades. We are working to improve access to valuable content we have developed to assist facilities, clinicians and public health practitioners across Kansas improve their infection prevention and control and antimicrobial stewardship efforts. Please visit our site, and feel free to contact us for more information or assistance (program contact info on page 5)

For more information go to www.kdhe.ks.gov/1514



The Birth of Infection Prevention

The Infection Prevention Legacy of a Disgraced Obstetrician

Stephanie Lindemann, MPH
Antimicrobial Resistance Epidemiologist, KDHE

Ignaz Semmelweis was a Hungarian-born physician now known as a pioneer in the field of infection control. He began his career at Vienna General Hospital in 1846 during a time when puerperal fever resulted in a post-partum maternal mortality rate exceeding 10 percent. Vienna General was the largest hospital at the time and split into a ward attended by medical students and another by midwives. Dr. Semmelweis recognized that the physician and medical student ward patients suffered three times greater mortality than the midwife's ward. He hypothesized and tested several factors (e.g., birthing positions, psychologic factors) yet his breakthrough came after a colleague with an autopsy-related scalpel injury died with a process akin to puerperal fever. Semmelweis suspected that cadaveric particles were introduced into the birth canal of mothers via the hands of their attendants, who had performed autopsies prior to the examinations.

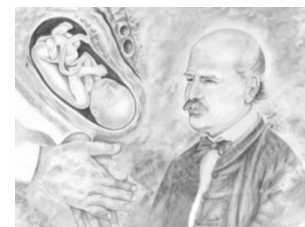


Photo Source: owlcation.com

The mystery was solved: maternal mortality was higher because medical students and physicians participated in autopsies but midwives did not.

Semmelweis discovered something which still holds true today: Hand-washing is one of the most important tools in public health

To test his hypothesis, he implemented post-autopsy mandatory handwashing with a chlorine solution and mortality rates of the wards equilibrated. These observations were in opposition to the established scientific dogma of the time.

Despite publishing findings in *The Lancet* and wide dissemination of the reduced deaths, Dr. Semmelweis faced ridicule, was dismissed from Vienna General, lapsed into depression and died fifteen years later in an asylum. Dr. Semmelweis was one of the first to formally reveal the benefits of hand disinfection for infection prevention and control, and undeniably made significant contributions to the understanding of infectious disease etiology.

History of the Semmelweis Times Newsletter

Rebooting our Quarterly Kansas HAI/AR Newsletter

KDHE HAI/AR Program Staff



Origins

The KDHE Semmelweis Times newsletter was created in 2016 as a way to highlight breaking research, training opportunities, and resources related to infection prevention

and control for infection preventionists in acute care settings. Previous issues have touched on a wide variety of topics including updated guidelines, toolkits from industry leaders, epidemiology of healthcare-associated infections and antimicrobial resistance in Kansas and

around the the United States, situation reports on emerging diseases (e.g., Zika, Ebola viruses), new research findings, and upcoming conferences, webinars

and other educational opportunities.

Re-launch

The COVID-19 pandemic has undoubtedly shed new light on the importance of infection prevention and control, and it's importance in

healthcare facilities beyond just acute care settings. We are excited to revive the Semmelweis Times newsletter with an added focus on antibiotic stewardship and One Health. The hope of our quarterly newsletters is to share the latest local and state antimicrobial resistance and healthcare associated infectious disease news, training opportunities and resources related to infection prevention and antimicrobial stewardship with clinicians and public health practioners across Kansas.

Antibiotic Stewardship Learning Action Network Series

April 7 – July 7

Kansas Department of Health and Envornment and Kansas Healthcare Collaborative are co-hosting a statewide Learning Action Network for inpatient settings focusing on antibiotic stewardship. This collaborative features four one-hour sessions focused on leadership and accountability, tracking and reporting and action.

Each session builds on the next, with real-world ways to implement antibiotic use and stewardship measurement tracking and reporting. There is no cost to participate, and CE is offered for nurses and pharmacists.

For more [information](#)
Register [here](#)

Antimicrobial Stewardship >>>

Combating Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X)

Five years of CARB-X: What has it taught us, and where are we now?

Eric Gregory, PharmD, BCIDP

Infectious Disease Pharmacist, TUKHS

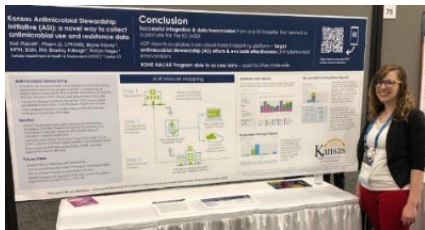
Combating Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X) was established in 2016 as a joint venture of the National Institutes of Allergy and Infectious Diseases, the Biomedical Advanced Research and Development Authority, the Office of the Assistant Secretary for Preparedness and Response, the Wellcome Trust, and others. Headquartered in Boston University, it is a rare example of a non-profit public-private relationship due to its leadership role in global non-dilutive funding of early-stage antimicrobial development. The CARB-X mission is striking, as it attempts to “accelerate a diverse portfolio of innovative

antibacterial products towards clinical development and regulatory approval with funding, expert support, and cross-project initiatives.” Initial plans were to invest up to \$480 million from 2016-2022 to support projects which focus on more than simply the treatment of infectious diseases but also delve into rapid diagnostics, vaccines, and other preventative products. Additionally, each project has an antimicrobial stewardship focus which helps ensure access to patients in low- and middle-income countries.

In its five years of existence, CARB-X has collaborated on 92 global projects, with 54 of
(continued on page 3)

Staff Highlight: Bryna Stacey KDHE HAI/AR Program Director

Bryna Stacey is the director of the HAI/AR Program at KDHE. She earned a Master of Public Health degree from Kansas State University in May 2012 and a Bachelor of Science degree in Nursing from Washburn University in May 2015. She is a licensed registered nurse in Kansas. Bryna worked as a critical care nurse in the Intensive Care Nursery at Children’s Mercy Hospital from July 2015 to January 2017 before accepting the HAI/AR Program Director position at KDHE in January 2017. She misses frontline care but loves what she does in the HAI/AR Program and is passionate about the work her team is doing to assist healthcare facilities in Kansas.



Facility Awards and Recognition

Is there a facility you would like us to recognize in our next issue? See the last page for information on how to contact us!

them currently active. Previous endeavors included therapeutic initiatives such as traditional direct-acting agents (for example pairing cefpodoxime with a novel oral beta-lactamase inhibitor to treat carbapenem-resistant *Enterobacteriales*) as well as the development of novel drug classes which target the lipopolysaccharides of Gram-negative bacteria or the improvement of bacteriophage therapy. Rapid diagnostic ventures have included the identification of pathogens and resistance markers using whole blood rather than blood cultures and another which determines antimicrobial susceptibility in four hours from blood culture growth. Others are focused on preventative strategies to modify the human microbiome leading to improved outcomes in *Clostridioides difficile* infections and after hematopoietic cell or solid organ transplant. Of note, the pipeline projects are not heavily focused in one category according to one recent publication (Table 1). A complete list of the portfolio as of September 13, 2021 can be found [here](#).

CARB-X pipeline by category	
Category	Number (Percent)
Traditional Direct-Acting Agents	15 (23)
Non-Traditional Agents	22 (34)
Peptides	7 (11)
Vaccines	8 (13)
Diagnostics	12 (19)

Table 1: Adapted from Duffy EM et al. *ACS Infect Dis.* 2021;7(8):2043-49.

In its five years of existence, CARB-X actively funds some of the most advanced research addressing the threat of antimicrobial resistance. A recent report suggested \$361 million have been invested and nine projects fully graduated from the CARB-X portfolio

with at least two of those securing regulatory approval. The issue of antimicrobial resistance is a threat both locally and globally, but CARB-X is well-positioned as a strong leader in the early-stage research product development space.

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1. Stewardship & Access Plan (SAP) Development Guide, 2021. www.carb-x.org/about/stewardship-and-access (accessed August 30, 2021).
2. CARB-X. Overview. <https://carb-x.org/about/overview/> (accessed August 30, 2021).
3. CARB-X. Portfolio-Product Developers. <https://carb-x.org/portfolio/portfolio-companies/> (accessed October 11, 2021).
4. CARB-X. Complete Portfolio, as of 3/2/2022. <https://carb-x.org/wp-content/uploads/2021/09/CARB-X-Pipeline-2021.09.13.pdf> (accessed March 2, 2022).
5. CARB-X. News. CARB-X celebrates five years of progress in early-stage product development against antibiotic resistant bacteria. <https://carb-x.org/carb-x-news/carb-x-celebrates-five-years-of-progress-in-early-stage-product-development-against-antibiotic-resistant-bacteria/> (accessed October 11, 2021).
6. Duffy EM, Buurman ET, Chiang SL, et al. The CARB-X portfolio of nontraditional antibacterial products. *ACS Infect Dis.* 2021;7(8):2043-2049.

ask the experts >>>

Q: How Do I Enroll in the AUR Module NHSN?

A: The AUR module contains two options: one focused on antimicrobial use and the second on antimicrobial resistance (AR). Manual data entry is not available for the AUR Module. To participate in either option, the National Healthcare Safety Network facility administrator must coordinate with their pharmacy and/or laboratory information software providers to configure their system to generate standard formatted file(s) to be imported into NHSN. To learn more please see Chapter 11 of the NHSN Patient Safety Manual:

www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf

Additionally, eligible hospitals and critical access hospitals participating in the Promoting Interoperability Program can use participation in submitting data to the NHSN Antimicrobial Use and Antimicrobial Resistance Module as one of the options in meeting the Public Health Registry reporting

element within the CMS Medicare Promoting Interoperability. To learn more, please see:

www.cdc.gov/nhsn/pdfs/cda/PHDI-Facility-Guidance-508.pdf



Robert Geist, MPH, CIC, FAPIC

HAI Response Advanced Epidemiologist, KDHE

Journal Club

Antimicrobial resistance related deaths are far greater than previously thought

Kellie Wark, MD MPH

AR/AS Subject Matter Expert, KDHE

Infectious Disease Physician, KUMC

Background

This was the largest and most comprehensive assessment of antimicrobial resistance (AMR) globally. This systemic review was based off of data obtained from 204 countries, reviewing 471 million individual records or isolates, and over 7,000 study-location years to determine the mortality associated with 23 bacterial pathogens and 88 drug-pathogen combinations in 2019. An international team of researchers used statistical modelling to produce estimates of AMR burden for all locations.

References

Murray C., et al. Global Burden of bacterial antimicrobial resistance in 2019: a systematic review. *The Lancet* 2022; 399(10325): 629-55.

Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis



Antimicrobial Resistance Collaborators*



Summary

Background Antimicrobial resistance (AMR) poses a major threat to human health around the world. Previous publications have estimated the effect of AMR on incidence, deaths, hospital length of stay, and health-care costs for specific pathogen–drug combinations in select locations. To our knowledge, this study presents the most comprehensive estimates of AMR burden to date.

Lancet 2022; 399: 629–55
Published Online
January 20, 2022
[https://doi.org/10.1016/S0140-6736\(21\)02724-0](https://doi.org/10.1016/S0140-6736(21)02724-0)

Findings

An estimated 4.95 million (95% uncertainty interval [UI] 3.62–6.57) deaths were associated with bacterial AMR in 2019, and 1.27 million (95% UI 0.911–1.71) were directly attributable to AMR. The highest regional all-age death rate was in sub-Saharan Africa at 27.3 deaths per 100,000 population, and lowest in Australia (6.5 deaths per 100,000). This makes AMR one of the most deadly infectious diseases globally. Only ischemic heart disease and stroke accounted for more deaths the year of the review. The seven leading pathogen–drug combinations for attributable and associated

deaths were MRSA, MDR-TB, third-generation cephalosporin and fluoroquinolone-resistant *E. coli*, carbapenem-resistant *A. baumannii*, carbapenem-resistant *K. pneumoniae* and third-generation cephalosporin resistant *K. pneumoniae*.

National Impacts

These findings shed light on the true death toll of AMR, with even greater action needed for antibiotic stewardship actions, state surveillance efforts, and facility infection prevention and control efforts.

Upcoming events:

April 7, May 5, June 2, July 7 – Kansas Healthcare Collaborative + Kansas Department of Health Environment, Antibiotic Stewardship Learning Action Network Series

This four-part monthly series of noon-time sessions focuses on building knowledge and confidence in building and improving upon antibiotic stewardship practices.

Aimed at Kansas stewardship leaders in the inpatient, outpatient and long-term settings, healthcare providers, pharmacists, infection preventionists and public health practitioners.

Free CE is offered for nurses and pharmacists

Register [here](#)

May 10-11 –Minnesota Antibiotic Stewardship Conference

Explore Usine Data for Action. Identify and track opportunities for prescribing improvement, tele-stewardship, consultant pharmacist's role, and tracing in outpatient settings, plus more.

Aimed at healthcare providers, pharmacists, nurses, infection preventionists, dentists administrators and public health professionals. This FREE virtual conference with keynote and concurrent sessions. CE credits are available.

Register [here](#)

March 22 – 24 – Virtual NHSN Training:

The Centers for Disease Control and Prevention's National Healthcare Safety Network (NHSN) held a 2022 Virtual NHSN Training: Patient Safety, Outpatient Procedure, and Neonatal Component Surveillance and Analytics. Free CE. Missed the live event, access the on-demand [here](#).

To contact NHSN, please email nhsn@cdc.gov



coming soon >>>

In The Next Issue

*Tracking Antibiotic Use Amongst
Kansas Clinicians*

*Infection Prevention in Kansas Facilities
and Nursing Homes*

*New Antibiotic Susceptibility Breakpoints
in Small Animals*

Kansas Collegiate Flu Challenge

We want to help with HAI/AR and AS! Contact us at:

HAI/AR Program

785-296-4167

kdhe.HAIARProgram@ks.gov

24/7 Epidemiology Hotline

877-427-7317

kdhe.epihotline@ks.gov

Do you have topic suggestions for future issues?
Send them to us!:

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Healthcare-Associated Infections & Antimicrobial Resistance Program

