Figure 1. Combination options for experience with personal protective equipment use.

Set #1	Set #2	Set #3
		
- Disposable gown - Vinyl gloves - Mask (dental or KF94)	- Disposable, waterproof long-sleeve gown - Gloves (Latex or Nitrile) - Goggles or Face shield - N95 mask - Hair cap when necessary	- Level D coverall - Gloves (Latex or Nitrile) - Goggles or Face shield - Shoe cover - N95 mask - Hair cap when necessary
Set #4	**Set #5**	**Set #6**
		
- Set #3 + Apron or - Set #3 + vinyl gown	- Level C coverall - Gloves (Latex or Nitrile) - Goggles or Face shield - Shoe cover - N95 mask - Hood or apron when necessary	- Level C or D coverall - Gloves (Latex or Nitrile) - Shoe cover - N95 mask - Powered air purifying respirator - Apron or vinyl gown when necessary

bottom for shoe covers. Moments for self-contamination concerns were: adjusting PPE that has slipped down (e.g., masks, gowns, gloves, goggles/face shield, and hoods); doffing hood procedure (e.g., PAPR); and skin contact of shoe cover surfaces during doffing. Most difficulties when using PPE combinations were unfamiliarity with donning/doffing procedures. Participants wish to develop various PPE sizes which can be easily donned/doffed intuitively (e.g., well-ventilated integral PPE). **Conclusion:** Collaboration with manufacturers based on our results is necessary to develop better PPE options for HCP's safety and satisfaction.

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doi:10.1017/ash.2024.278

Figure 1. Flowchart of the study selection process of the concept analysis

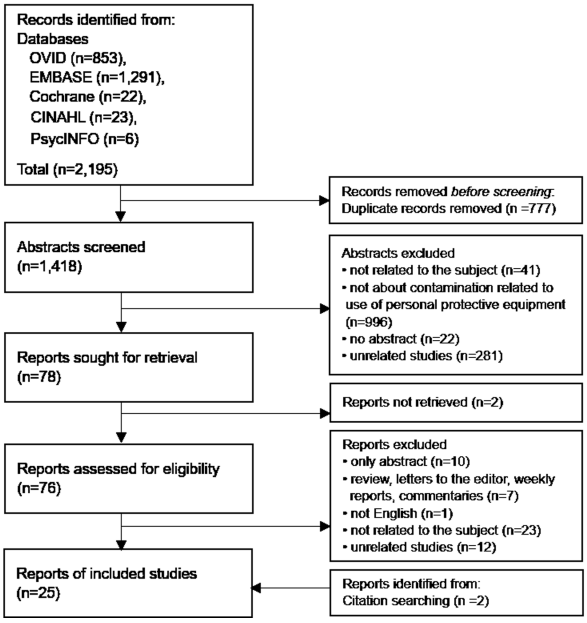
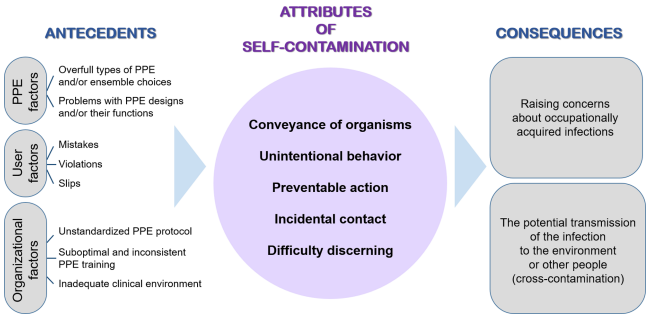


Figure 2. Summary of the 'self-contamination' concept analysis results



Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: Occupational Health

Self-contamination with use of personal protective equipment: Concept analysis using Rodgers' evolutionary method

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Background: Although self-contamination has been identified through relevant studies on the safe utilization of personal protective equipment (PPE) by healthcare personnel and the prevention of healthcare-associated infection transmission, there is a lack of in-depth understanding of self-contamination. This study aimed to review previous research on self-contamination and clarify the concept. By understanding this concept, healthcare personnel can improve their conscientiousness regarding self-contamination and gain a foundation for the requisite interventions to reduce self-contamination in healthcare settings. **Method:** MeSH terms such as "Health Personnel," "Students, Health Occupations," and keywords related to PPE combined with "contaminat*" and "self-contamination" to retrieve literature in OVID, EMBASE, Cochrane, CINAHL, and PsycINFO databases without time limits through December 2023 (Figure 1). The concept of self-contamination's antecedents, attributes, and consequences were explained based on Rodgers' evolutionary **Results:** After eliminating duplicates from the 2,195 studies that were initially searched, the authors reviewed the articles and determined eligibility independently. A total of 25 articles, published between 2006 and 2023, were included and analyzed. Antecedents to self-contamination were classified into three groups for each component (Figure 2). First, PPE factors included 1) types of PPE and/or ensemble choices, and 2) problems with PPE designs and/or their functions. Second, user factors involved 1) mistakes (errors of intent), 2) violations (deviations from recommendations), and 3) slips (natural flaws in humans). Third, organizational factors covered 1) unstandardized PPE protocol, 2) suboptimal and inconsistent PPE training, and 3) inadequate clinical environment. In total, five major concept attributes were the conveyance of organisms, unintentional behavior, preventable action, incidental contact, and difficulty discerning. Consequences were categorized into: 1) raising concerns about occupationally acquired infections, and 2) the potential transmission of the infection to the environment or other people (cross-contamination). **Conclusion:** While studies have raised questions about whether

self-contamination causes infection, self-contamination was obvious among healthcare personnel when dealing with PPE. Considering the wide range of causes and potential results of self-contamination, multifaceted interventions, including improvement of the PPE design, tailoring protocols, and training for specific ensembles, should be implemented over an extended time period with suitable intervals to optimize interventions' effectiveness.

Antimicrobial Stewardship & Healthcare Epidemiology 2024;4(Suppl. S1):s122–s123
doi:10.1017/ash.2024.279

Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: Outbreaks

Stenotrophomonas maltophilia Bloodstream Infection Outbreak in an Acute Care Hospital — Alameda County, California 2022–2023

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Background: Stenotrophomonas maltophilia is an opportunistic pathogen found in healthcare settings. During April–September 2022, nine S. maltophilia bloodstream infections (BSIs) were identified among intensive care unit (ICU) patients at a hospital in Alameda County, California. Whole genome sequencing found isolates to be highly related. Despite implementation of infection prevention and control (IPC) interventions, four additional S. maltophilia BSIs were identified during June–September 2023. We investigated to identify risk factors for infection and stop transmission. **Methods:** We conducted a matched case-control study. A case was defined as S. maltophilia isolated from a blood culture from an ICU patient with a fever during April 2022–September 2023; control-patient subjects were patients admitted to the ICU during the same period with hospital stay greater than or equal to their matched case. Three control subjects were matched to each case. We extracted information on risk factors for infection from medical charts and observed IPC practices in hospital locations of interest. We collected environmental samples from the ICU, radiology unit, and emergency department. **Results:** Among 13 cases and 39 control subjects, patients exposed to iodinated contrast Omnipaque-300 (odds ratio [OR]: 5.7; 95% CI: 1.2–28.0), injectable propofol (OR: 12.2; 95% CI: 1.5–101.4), or fentanyl (OR: 9.2; 95% CI: 1.8–Inf.) were more likely to have a S. maltophilia BSI, compared with control-subjects. IPC deficiencies included improper cleaning and storage of medical equipment, including the contrast injection system, and patient care supplies. The outbreak strain of S. maltophilia was not isolated from environmental samples. **Conclusions:** Although a point-source was not identified, S. maltophilia was likely transmitted through improper IPC practices involving injectable contrast or anesthesia. Recommendations on proper cleaning and disinfection of the contrast injection system and proper storage, preparation, and administration of medications were made to reduce risk for contamination.

Antimicrobial Stewardship & Healthcare Epidemiology 2024;4(Suppl. S1):s123
doi:10.1017/ash.2024.280

Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: Outbreaks

Characterizing Response Capacity of Healthcare-Associated Infection/ Antimicrobial Resistance Programs — US, 2019–2022

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Background: Since 2009, the CDC has invested in nationwide outbreak response capacity through Healthcare-associated Infections and Antimicrobial Resistance (HAI/AR) Programs in public health departments. The unpredictable nature of outbreaks requires public health programs to be able to scale operations and adapt strategies to effectively respond to emerging challenges, as demonstrated by the COVID-19 pandemic. This analysis characterizes HAI/AR Programs response capacity in scalability, adaptability, and technical expertise. **Method:** We reviewed data from HAI/AR Programs in 50 state, 6 local, and 2 territorial health departments (August 2019–December 2022). HAI/AR responses were defined as specific public health actions to assess an acute risk and prevent further harm in the context of a confirmed or possible healthcare outbreak; responses were categorized as involving novel or targeted multi-drug resistant organisms (nMDROs), COVID-19, and HAIs or infection control breaches. Descriptive statistics were used to analyze reported responses in three domains: scalability (number of responses per year), adaptability (number of pathogens and healthcare facility types involved in responses), and technical expertise (number of responses involving onsite or remote infection control assessments). The annual number of responses conducted in 2019 was estimated based on five months of data (Aug–Dec); all other results were calculated directly. **Results:** From August 2019 to December 2022, 58 HAI/AR Programs reported 141,445 responses (87% COVID-19, 11% nMDROs, 2% other HAIs or infection control breaches). Annually, programs conducted an estimated 5,546 responses in 2019, and this figure rose to 42,359 in 2020, 49,124 in 2021, and 47,651 in 2022. Outbreak responses involved 110 different pathogens, including emerging infectious diseases (e.g., SARS-CoV-2, mpox), nMDRO (e.g., carbapenemase-producing organisms, Candida auris), and other pathogens (e.g., hepatitis viruses, Mycobacterium abscessus) across >20 setting types (e.g., acute care hospitals, skilled nursing facilities, ambulatory surgery centers, assisted living facilities). Additionally, programs responded to infection control breaches in the absence of identified patient infections, including drug diversion, medical device reprocessing, and injection safety breaches. Programs conducted 50,245 infection control assessments during reported responses. **Conclusion:** From 2019–2022, as the COVID-19 pandemic took hold, HAI/AR Programs effectively utilized CDC funding to scale their response operations with an 8-fold increase in annual response activity, including a 24% increase for non-COVID-19 responses. Programs adapted responses to various pathogens, including emerging infectious diseases, across various setting types. Health department staff utilized technical expertise to conduct infection control assessments. This analysis provides valuable insights into the resilience and impact of HAI/AR Programs nationwide.

Antimicrobial Stewardship & Healthcare Epidemiology 2024;4(Suppl. S1):s123
doi:10.1017/ash.2024.281