UMASH Annual Forum

Antimicrobial Resistance in Agriculture: Is it a Worker Health Issue?

September 26, 2019

Event Summary

On September 26th, 2019 the UMASH Annual Forum: "Antimicrobial Resistance in Agriculture: Is it a Worker Health Issue" gathered a multidisciplinary array of professionals to share information, identify key concerns, and strategize responses pertinent to the issue of antimicrobial resistance (AMR) and its relevance to agricultural worker health and safety. Forum attendees represented many backgrounds, including health care, government, non-profits, and academia.

Panel discussions featured presentations by: **Kristen Obbink** DVM, MPH, DACVPM, CCRT, **Peter Davies** BVSc, PhD, **Carrie Klumb** MPH (Senior Epidemiologist at the Minnesota Department of Health), **John Shutske** PhD, and **Russ Daly** DVM, MS, DACVPM. These experts shared a wealth of information about AMR related to agriculture, including key points such as:

- AMR is truly a 'one health' issue-- shared between humans, animals, and the environment.
- AMR is a **highly complex** problem and affects every discipline and industry, not just agriculture; therefore, understanding and addressing AMR requires multifaceted solutions stemming from many perspectives. **Collaboration is imperative**
- Agricultural workers are regularly *exposed* at a high rate to the bacterial flora of animals they work with, including bacteria that are resistant to particular antimicrobials. However, there is little scientific information regarding the impacts on health (disease) that may result from this bacterial exposure.
- Based on very preliminary data, it appears that **living or working on an animal farm suggests a risk for enteric disease that is 8 times higher than the general population**. Ongoing research is continuing to help quantify the potential risk of developing antibiotic resistant enteric diseases among agricultural populations.
- It is important to seek potential interventions that can reduce worker risk through changes in production **systems** (i.e. administrative and engineering controls).

  Emerging agricultural industry and technology changes (i.e. less human labor) should be taken into consideration to provide appropriate approaches to both animal *and* worker health.

During the Q&A session, forum participants were asked to work in small groups to discuss the most pressing questions and concerns about infectious disease risk and antimicrobial resistance with respect to workers in agriculture. The following are some of the priority questions the small groups provided:

- Do agricultural workers truly experience an increased risk of AMR disease? Is AMR infections from agriculture spread to the greater community?
- Do specific "bugs and drugs" present a particular concern? Do specific reservoir species present particular concern?

- How can we quantify the “animal contact” that results in illness?
- What do agricultural workers think are the most important questions about AMR and its effect on their health?
- What disciplines can we recruit to join the “one health” approach (i.e. hospital systems or long-term care facilities)? What is their role?

Based on these critical questions, the following approaches were raised as ways to address the problem:

- Involve key perspectives, including:
    - Epidemiologists: to evaluate current methodologies for measuring resistance and outcomes
    - Social scientists: to identify the behaviors that drive AMR risk on the farm and seek management situations
    - Industrial Hygienists: to identify ways to engineer in solutions as agricultural technology progresses
    - Producers and workers: as essential informants to access practical key ideas and solutions
    - Community health workers and local public health: to inform and implement interventions
    - Agricultural and other types of engineers: to design animal and manure handling systems that have the potential to minimize exposures to people and improve animal health
    - Veterinarians: to monitor and guide use of antimicrobials
- Identify:
    - Best practices, including engineering and system controls that reduce overall exposure to enteric pathogens, especially those with the potential for AMR
    - A priority threat list of resistant bacteria and diseases
    - Pertinent social determinants of health, such as healthcare seeking behaviors or social settings among agricultural workers that facilitate transmission
- Integrate appropriate antibiotic use into the general worker health conversation
- Employ metagenomics techniques to identify the population of resistance determinants that workers may be acquiring from agricultural settings

Overall, the UMASH Annual Forum provided the context for an important discussion about the potential implications for AMR and its effect on agricultural worker health and safety. Expert panelists and participants alike emphasized that this complex issue requires thoughtful questions and multidisciplinary collaboration. We hope that the ideas and questions raised at the Forum appropriately set the stage for meaningful next steps, including the pursuit of UMASH funding for partner projects.

For more information about submitting a pre-proposal, see: umash.umn.edu/2019-annual-forum.