

“Working” Agricultural Safety and Health: research efforts across disciplines and the translational spectrum

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Conflicts of Interest

I have the no conflicts of interest to report. This includes any nonprofit and for-profit boards I (or my spouse) sit on, any for-profit businesses for which I or an immediate family member are an officer or director, or a majority shareholder, and the name of my employer and any businesses I or my family own.

Paths Forward (and Back Again)

Introductions

Thinking Translationally

Thinking Holistically

Final Thoughts

Questions

Personal Background

- Family farm in Idaho
 - Barley, wheat, alfalfa
 - Beef cattle, sheep, horses
 - Outfitting
- 9 years competing in rodeo
 - College and professional
 - Bareback bronc riding
- Served as a volunteer firefighter
 - Resident fire/EMS program at the University of Idaho
 - FF1, EMT-B, Apparatus-Driver



Mission Statement-

With the ultimate goal of improving human health, well-being, and safety of rural and agricultural communities, the National Farm Medicine Center was established in 1981 and will continue to be a national resource by conducting high quality research, developing and disseminating health and safety information, exploring innovative intervention models, and leading initiatives that bring about broad, positive change.



National Children's Center
for Rural and Agricultural Health and Safety



UMASH Upper Midwest
Agricultural Safety
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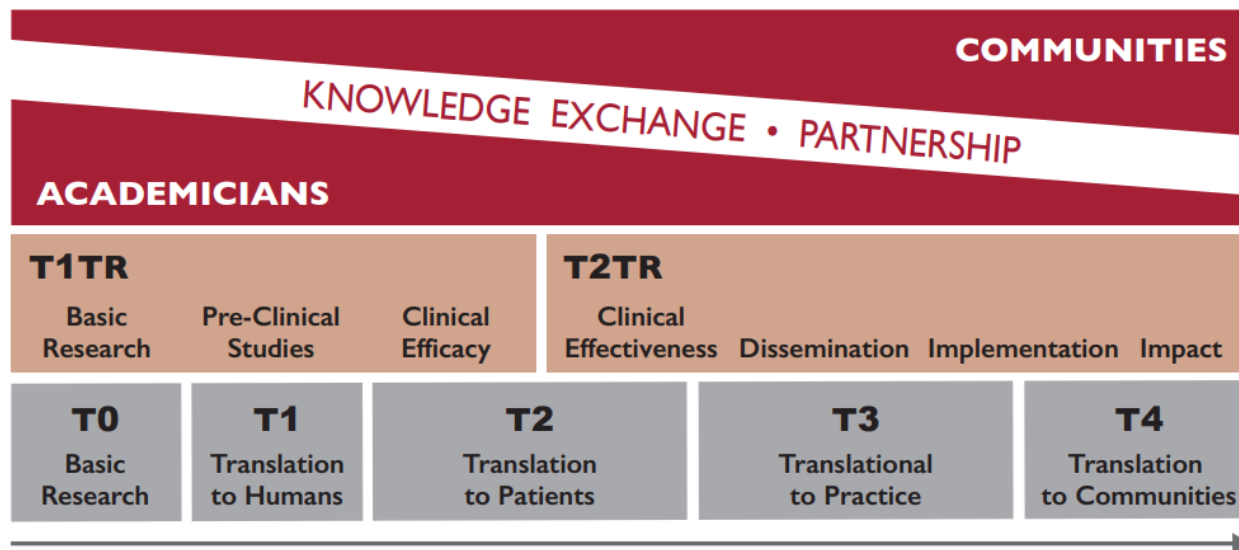


- | | |
|------------------------------------|--|
| 1. Bassett Healthcare | 6. University of Iowa |
| 2. Colorado State University | 7. University of Kentucky |
| 3. National Farm Medicine Center | 8. University of Minnesota |
| 4. University of California, Davis | 9. University of Nebraska Medical Center |
| 5. University of Florida | 10. University of Texas Health Science Center, Tyler |
| | 11. University of Washington |

Thinking Translationally

The process of turning observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public — from diagnostics and therapeutics to medical procedures and behavioral changes – National Center for Advancing Translational Sciences

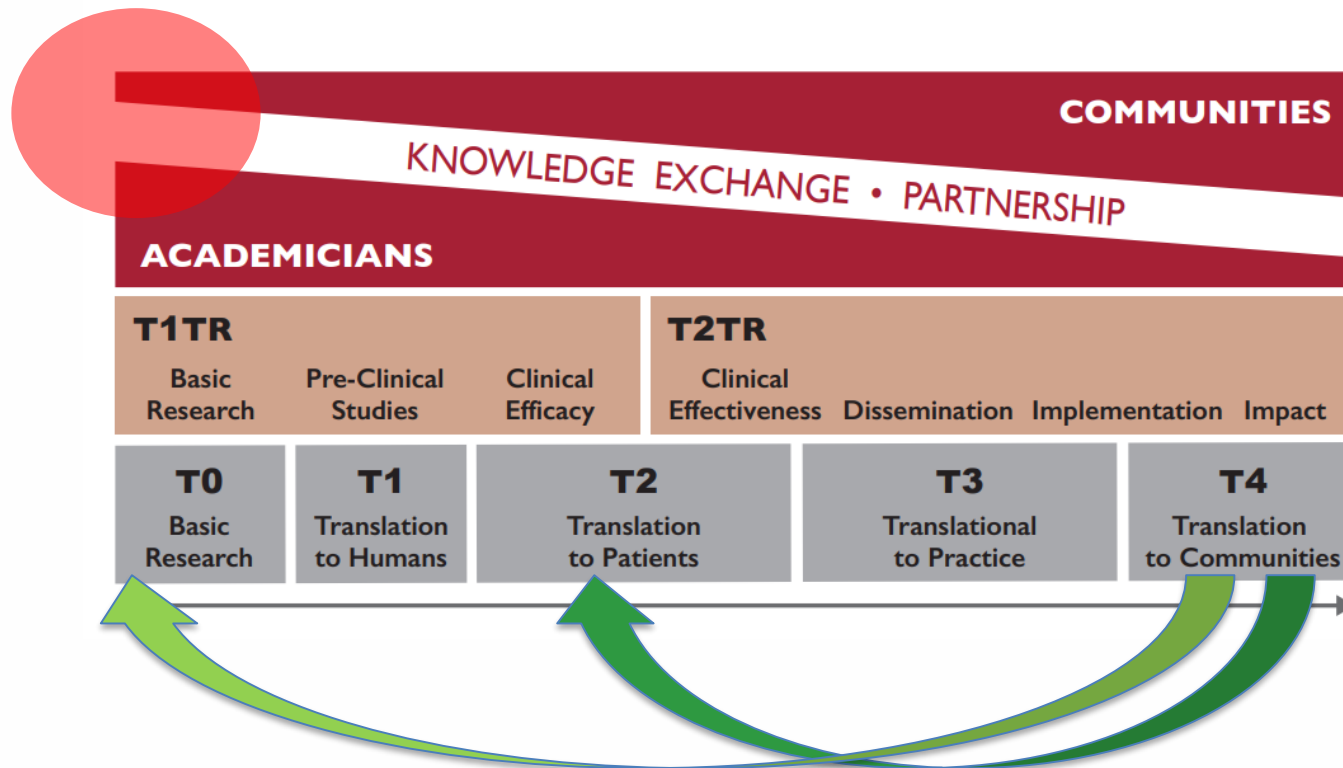
What is the T0 to T4 Translational Research Continuum?



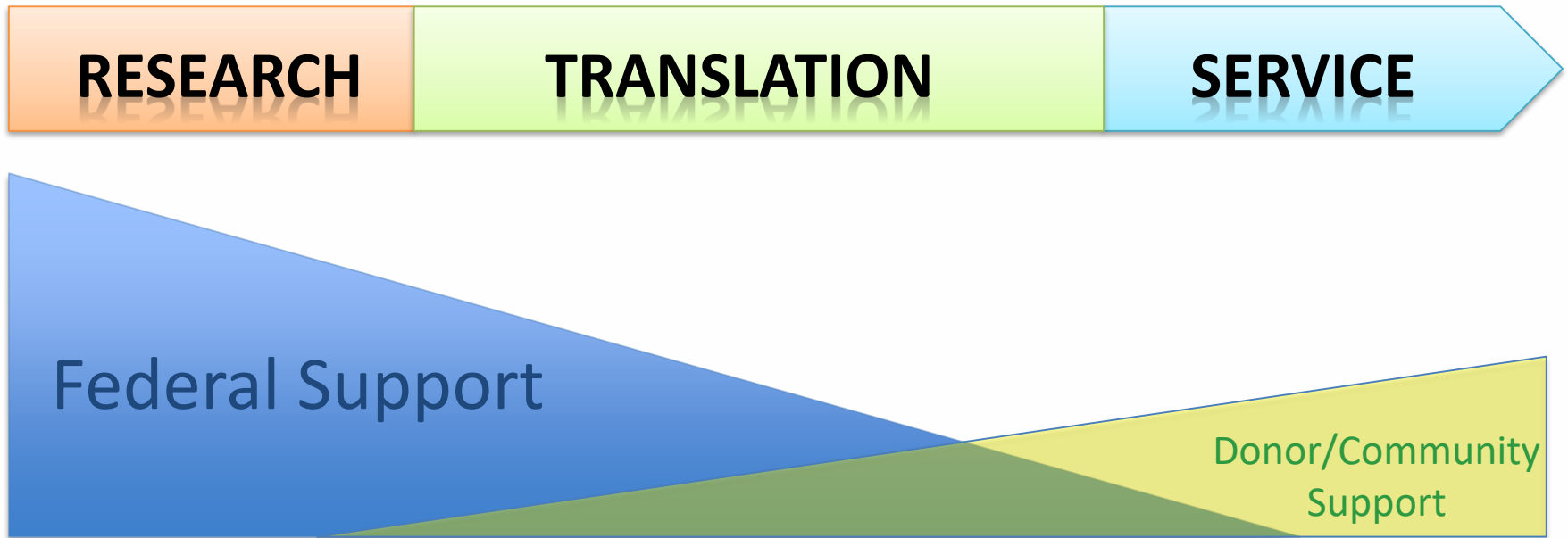
Thinking Translationally - again

Problem: too little, too late

What is the T0 to T4 Translational Research Continuum?



Funding and the Translational Scale



**Translational science, dissemination and implementation science, and community involvement in the entire translation spectrum needs further investment and recognition.*

Rural Firefighters Delivering Ag Safety and Health

- Farmers expressed willingness to make changes if given advice from their local fire department
- Program designed to equip rural firefighters and EMS with agriculture health and safety knowledge



RF-DASH Curriculum

Eight hour training (4 hours in the classroom and 4 hours at a local farm)

Five modules

- 1) Intro to Ag Emergencies
- 2) Pre-Planning and Mapping farms
Farm MAPPER
- 3) Farm Hazard Analysis
Safer Farm
- 4) Farm First Aid
- 5) Reaching out to the Farm Community



Results (cont.) and Next Steps

Results (cont.)

- 5 train-the-trainer events
- Pending requests for new and refresher courses
- Trained over 78 fire and EMS trainers from 10 states and 5 provinces
- Trainers have gone out and trained over 30 trainers in other regions

Next Steps

- Trainer's Manual
- Online Community
- Virtual and Asynchronous Training
- NFPA and FEMA Standards
- Evaluate Farm Impact

“There’s a huge lost opportunity with us not doing essentially pre-incident plans at these agricultural sites because we do it all the time for our local industry and factories. However, for some reason, it just slips the mind that we don’t visit our farms. We don’t get that eyes-on, see what everything looks like, and get familiar with that. That was the whole eye-opening takeaway for me with the whole thing.” – RF-DASH National Trainee

“I think that’s the plus of the program, taking rural firefighters and engaging them with that population. It’s a small enough community that everyone knows each other. There’s already a relationship there so— it’s not a government agency or an insurance company or something threatening, it’s someone who knows them and says, ‘Dude, I care about you, Let’s work together to make it better.’” – RF-DASH Trainee

“When I see a victim of a farm accident, it’s just like when it’s someone from the fire service, even if I don’t know them it feels like I do because they are like brothers to me. Anything I can do to help make the ag industry safer I am more than willing to do” –RF-DASH WEMSA Trainee

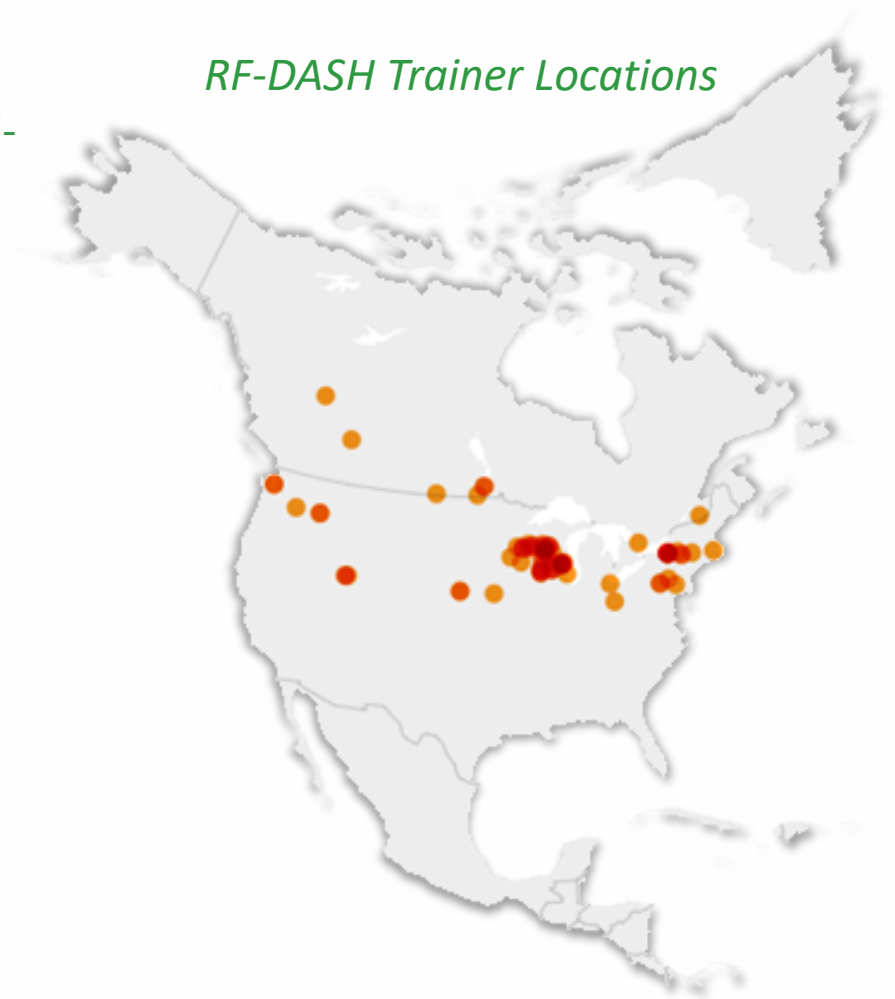
Results

- Flexible program model
- Receptivity and enthusiasm by Fire/EMS on RF-DASH has been tremendous
- National Fire Protection Association (NFPA) Standards i.e. 1300
- Triple threats
- Positive media attention and community response
- Fire/EMS around U.S. searching for programs to fulfill gap in pre-planning and hazard reduction on farms

Project Website: <http://rfdash.org/>

https://players.brightcove.net/1964492288001/default_default/index.html?videoId=5850970308001

RF-DASH Trainer Locations



Thinking Holistically

Social sciences: the human experience can be examined as a complex system, the parts of which are better understood in light of the whole

Medicine: the treatment of the patient includes examination of the whole of the patient, including environmental and social determinants of health

Occupational health and safety is often limited to the study and mitigation of hazards and risk OR the treatment of the resulting illness/injury

Along the lines of “occupational studies” – revisit inquiry into occupation as a complex human domain non-discrete from other human experiences

One example – the benefits of work

Farm Kid Paradox – Cows and Kids

The overall goal of this research is to discover how parents on beef and dairy operations as well as agricultural safety experts understand the risks and benefits of child-livestock interaction.

Burden: Child-livestock interactions are significant contributors to the of approximately 33 agriculturally related injuries to youth each day in the US. Moreover, there are biomedical facts and social cultural beliefs that support the benefits of child-livestock interactions – the Farm Kid Paradox.

Impact: Project outcomes will directly impact child-livestock safety messaging, bridging cultural and communication gaps between parents and safety professionals, and will provide new tools and concepts, expanding translational research efforts in the future.



Need: This conflicting information creates a significant barrier as interventions appear incompatible with cultural values and other science. Injury interventionists and their materials need to account for these cultural values and other medical facts.

Measured Benefits



- Children benefit from diverse, rich microbiomes early in life
- “Atopic march” is preventable

Patterns of Farm Exposure Associated with Occurrence of Itchy Rash in Early Life



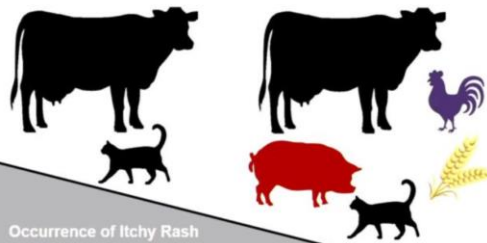
Non-Farm & Farm C (least exposure)

Farm B

Farm A (most exposure)

High

Low



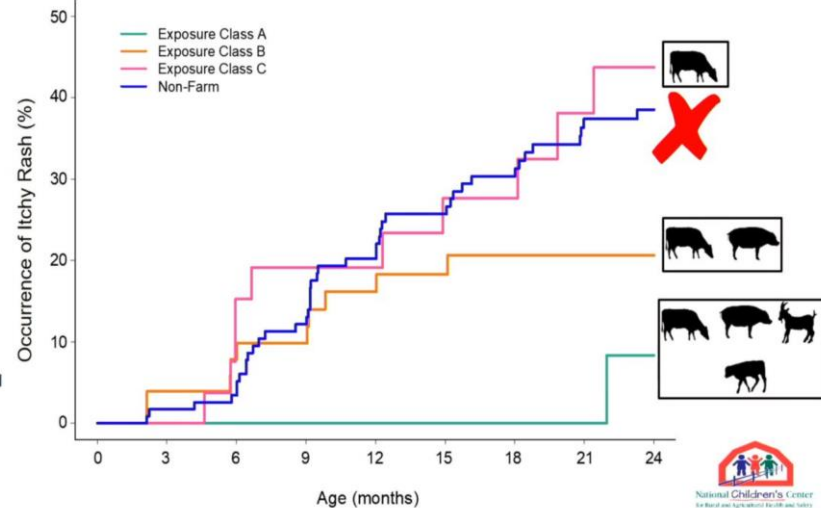
Occurrence of Itchy Rash

- Asthma is a globally debilitating disease
- There are fewer diverse ‘family’ farms

Farm Exposures were Related to the Risk of Itchy Rash



— Exposure Class A
— Exposure Class B
— Exposure Class C
— Non-Farm



Steiman C et al, J Allergy Clin Immunol 2020



Less Easily Measured Benefits

Social/Cultural Perceptions:

- Better work ethic
- More responsible (time management, fiscal, business relationships, etc.)
- Better understanding of life and death
- Improved empathy in the care of other living beings
- Stronger practical skills / Problem-solving
- Math and science learning/STEM and ag education
- Appreciation for the food system

Challenges with measuring perception:

- Parent bias – generally and specifically
 - Smarter, stronger, faster, etc.
- Rural and agricultural exceptionalism
- Temporary or retrospective
- Social acceptability
- Self-serving bias
 - As a parent, farmer, and rural person

If we continue to assume a dearth of child labor policy, rural childcare facilities, punitive measures for neglect/reckless behavior of adults . . . the perceived benefits / social esteem of being a farm kid may be a strongest barrier towards reducing child injury and fatality.

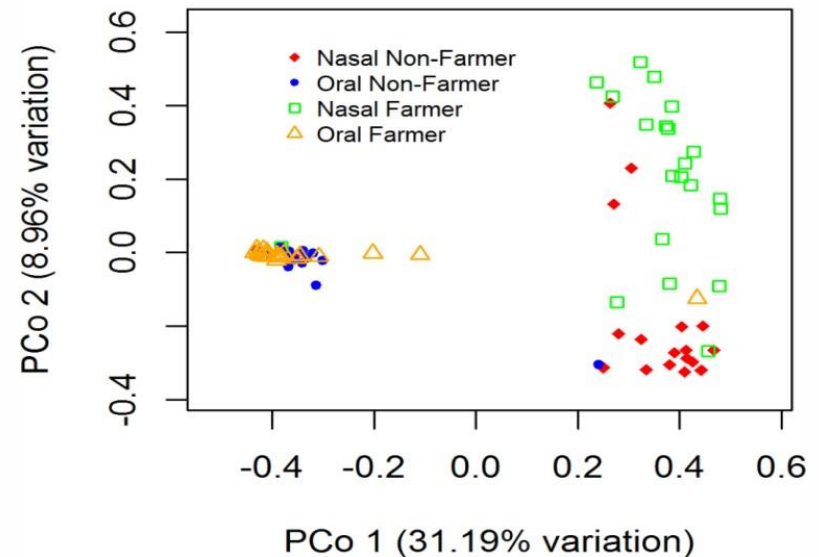
What if the biological and social/cultural benefits are real?

Farm Environment, Human Health, and the Microbiome

- Hypothesize microbiome in dairy farmers will be greater than those from a non-farming urban background
 - Nasal and oral samples from both groups from WI
 - 21 farm and 18 non-farm
- Results
 - Increased microbial diversity in dairy farmers
 - Staphylococcus significantly less in dairy farmers
 - Competition
 - Greater microbial diversity in nasal samples vs. oral samples
 - Reduced MRSA in dairy farmers nasal samples compared to non-dairy farmers



PCoA plot



My Final Thoughts

The future is holistic

- The worker is a person first and always

- The benefits of work may be as or more important than the hazards

The future is interdisciplinary

- This is how “whole” pictures are best formulated

The future is dependent on the ability to translate research

- Facts are better measured by the impact of their implementation

The future is more community-based

- Effective translation normally depends on community adoption

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“Farm Kid Paradox”

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Clinical Research Center*)

NIH-ECHO UG3 OD023282 (*Children’s Respiratory and Environmental Workgroup*)

“Dairy Microbiome (DOME)”

CDC-NIOSH 5R01OH011578

Questions?

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