

Council of State and Territorial Epidemiologists

Influenza Education Among Youth in Agriculture Pilot Project

North Dakota Department of Health (NDDoH)

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**Grant Application
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North Dakota Department of Health**

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Background

Agriculture is the primary industry in North Dakota's economy. With about one quarter of the working population employed in agriculture-related occupations and over 30,000 family farms and ranches throughout the state, agriculture plays a major role in the lives of many North Dakotans. Livestock production in North Dakota mostly consists of beef cattle, dairy cattle, swine, bison, sheep, goats, and turkeys. According to the National Agricultural Statistics Service (NASS), North Dakota had roughly 146,000 hogs as of December 2016. The North Dakota Department of Health (NDDoH) Division of Disease Control has been involved with investigating *Salmonella*, rabies, and influenza outbreaks associated with North Dakota swine, as well as additional zoonotic disease-related events in other types of livestock.

Agriculture is an important part of youth culture for many young people in our state. North Dakota 4-H has roughly 30,000 youth participating in activities. North Dakota Future Farmers of America (FFA) has 5,300 members in 84 chapters. Education focusing on animal diseases is part of the FFA curriculum, but information regarding the human-animal interface and prevention of zoonotic diseases is not a heavy focus, and would be welcomed by the local FFA and 4-H communities.

Fair attendance is also an integral part of the North Dakota lifestyle. Attendance at the 2016 North Dakota State Fair was 293,123, including attendees from nearby states and Canada. North Dakota also hosts around 30 county fairs and events each year that include livestock exhibits.

In 2014, swine sick with influenza were identified via routine inspection at the North Dakota State Fair. During our response to this event, we discovered opportunities for education of fair exhibitors and attendees regarding zoonotic diseases and the human-animal interface. Although North Dakota has never confirmed a case of variant influenza, the potential for human cases was and continues to be present. Like other states in the Midwest, North Dakota is also a jurisdiction that has recently seen influenza-positive turkey flocks, and zoonotic influenza is of particular concern.

The NDDoH routinely works with the North Dakota office of the State Veterinarian and the North Dakota Board of Animal Health on human/animal health topics, and can also leverage strong relationships with infectious disease and veterinary personnel in neighboring states. North Dakota is a member of the Midwest Flu Group and routinely shares information and materials regarding novel influenza and other influenza-related topics with this group. Additionally, the State Epidemiologist is an active participant in the Central Plains State Epidemiologist group which would allow for the exchange of ideas and best practices across state borders.

Resources

Personnel and Infrastructure

The North Dakota Department of Health (NDDoH) has experienced personnel to facilitate the project objectives and to build upon many existing relationships and partnerships with animal health and agricultural organizations.

The NDDoH Division of Disease Control has a partial full time employee dedicated to influenza surveillance and prevention education. This position is the Influenza Surveillance Coordinator. Additionally, there is a partial FTE who is the Influenza Program Manager who oversees the surveillance and prevention activities to ensure grant objectives are being met and progress is made toward achieving goals. The Influenza Surveillance Coordinator is a master's-level epidemiologist who has approximately four years of public health experience including influenza surveillance and prevention. The Influenza Program Manager has approximately 12 years of public health experience. The Influenza Program Manager coordinated influenza surveillance for five years at the NDDoH prior to being named program manager.

The NDDoH Division of Disease Control has a vectorborne, zoonotic and enteric disease epidemiologist. The Vectorborne/Zoonotic/Enteric Surveillance Coordinator has worked to build relationships with existing Disease Control programs and external partners, while monitoring zoonotic diseases in the state. This position maintains current collaborations to improve disease and outbreak response for zoonotic diseases. Strong relationships have been built with the North Dakota Department of Agriculture, the North Dakota State Board of Animal Health (BOAH), North Dakota Game and Fish, USDA Wildlife Services, and the Veterinary Diagnostic Laboratory. The Vectorborne/Zoonotic/Enteric Surveillance Coordinator has approximately two years of public health experience with the NDDoH.

The NDDoH State Epidemiologist began her career at the NDDoH as the Influenza Surveillance Coordinator before being named program manager, and then State Epidemiologist in 2010. The State Epidemiologist works 50 percent of her time in the Division of Disease Control directing surveillance projects, providing guidance during disease investigations, and developing public health indicators for strategic planning. Additionally, the State Epidemiologist is responsible for planning and organizing the NDDoH One Health Workgroup.

The Influenza Surveillance Coordinator, Influenza Program Manager, Vectorborne/Zoonotic/Enteric Surveillance Coordinator, and the State Epidemiologist are key personnel at the NDDoH with the experience and ability to implement and sustain the proposed education program.

Existing Platforms

The NDDoH plans to build upon existing educational and agricultural organizations in the state to facilitate the delivery of the health education messages and materials. Partnering with these organizations will offer sustainability in the project over time.

The North Dakota State University (NDSU) extension service has a 4-H youth development program that is offered in every county in North Dakota. There are multiple events that occur every month (January-October) which will give opportunity to partner with this organization to meet the six project objectives. The four "H" cornerstones are "Head, Heart, Hands, and **Health**." This CSTE grant will offer enhancements to the North Dakota 4-H youth development program while fulfilling NDDoH

goals to improve zoonotic disease surveillance, awareness, knowledge, and prevention. A letter of support from the NDSU Extension Service – Center for 4-H Youth Development to partner with the NDDOH is included with this application. (See Appendix A).

The North Dakota Future Farmers of America (FFA) chapter has been an important part of North Dakota public agricultural education programs. Because one of the main goals of the North Dakota FFA association is “To prepare persons for any occupations requiring knowledge and skills in agriculture”, partnering with this organization will be another way to deliver health education messages and programs. Additionally, this organization offers opportunity for classroom or remote learning. Several opportunities have already been identified as possibilities to collaborate including, a regional convention in June, a conference with FFA advisors in August, and the FFA leadership conference in January.

Influenza as a zoonosis is an important message to communicate to youth agriculture organizations and participants. Risk of transmission, clinical signs of illness in animals, and prevention messages have been developed by the Centers for Disease Control and Prevention (CDC) influenza program and other state health departments. The Influenza Surveillance Coordinator and Program Manager participate in a Mid-West Influenza Workgroup with members who have worked on educational projects and developed relevant materials relating to variant influenza and avian influenza awareness and prevention. This group will be a resource for the NDDoH program to acquire already developed content to use in our programs. Additionally, because this group contains states within a geographic region, there are similarities in agriculture interests and programs that can be used to help partner.

The NDDoH has partnered with the ND Department of Agriculture State Veterinarian’s office for many years. Throughout the years, our organizations have worked together with West Nile virus, rabies, avian influenza, Brucellosis, Tularemia, tick surveillance, enteric diseases, anthrax, and most recently Seoul virus. Staff from the NDDoH regularly attend the BOAH meetings and have presented information to the board members on occasion. During the North Dakota State Fair, two of the state veterinarians are present at the time of animal intake and over the course of the animal showings. This standing platform would be a good way to distribute educational materials to the state fair animal exhibitors.

Another resource to the NDDoH is the North Dakota One Health Group. This group was originally established in the early 2000’s after the widespread re-emergence of H5N1 avian influenza. Since then this group meets at least annually to discuss current issues and possible collaborations. This work group includes members from the NDDoH, Department of Agriculture (including the State Veterinarian’s office), NDDoH Public Information Office, and the North Dakota State University (NDSU) Veterinary Diagnostic Laboratory (VDL), North Dakota Game and Fish, USDA Wildlife services, and USDA Animal and Plant Health Inspection Service. The North Dakota One Health group will be a resource to the NDDoH to identify venues, organizations and platforms to partner with to carry out project objectives.

Additionally, the State Epidemiologist leads the human-animal antibiotic stewardship committee (HAASC). In 2014, the North Dakota Department of Health’s State Health Officer invited the State Epidemiologist, Agriculture Commissioner, and State Veterinarian, to talk about the need to develop a collaborative in an effort to address antibiotic stewardship needs among human and animals. Over the course of the two years, the HAASC would meet 2-3 times per year. In that time, the group expanded to include a laboratorian from the VDL, an infectious disease physician, professors from NDSU,

NDDoH's Healthcare Associated Infections program manager and the NDSU Extension Service. This group collaborative could be an additional resource in order to identify venues, reach out to organizations and provide additional platforms that could be utilized to increase the reach of our education.

Prior Collaborations with Partners

The NDDoH has collaborated with animal health state agencies on a number of surveillance projects and health education efforts. Below is a list of some of the examples of collaboration in recent years.

- High Pathogenic Avian Influenza in North Dakota Commercial Turkey Flocks
 - In April of 2015, two outbreaks of high pathogenic avian influenza (HPAI) H5N2 were identified in North Dakota, affecting commercial turkey flocks in two counties. The North Dakota Department of Agriculture led the state and federal collaborative effort to investigate and control the outbreak. The North Dakota Department of Health (NDDoH) provided guidance for potentially exposed individuals regarding self-monitoring, influenza antiviral recommendations and personal protective equipment. A total of 17 people were identified as having possibly been exposed to HPAI, but none subsequently developed symptoms. Between the two outbreaks, 129,000 turkeys and 2,000 chickens were destroyed to help control the pathogen. Additionally, we worked with the Midwest Flu Group to exchange materials such as human monitoring forms and educational materials during the outbreak response.
- Influenza in Pigs at State Fair
 - At the 2014 North Dakota State Fair, three pigs were removed from display after they appeared to be ill. The pigs, all with different owners and handlers, arrived at the fair on July 20 and began showing symptoms on July 25. When the illness was discovered, the pigs were subsequently removed from exhibit. Respiratory samples were collected from the pigs and tested at a United States Department of Agriculture (USDA) lab, where all three specimens were found to be positive for swine influenza A H3N2. Because transmission of this disease from pigs to humans has been demonstrated, the North Dakota Department of Health (NDDoH) sent out a Health Alert on August 1 requesting that health care providers consider H3N2v in patients with influenza-like illness (fever, cough, sore throat, body aches, and headache). Providers were requested to ask these patients about swine contact and to send samples to the public health lab for testing.
- Salmonella in Baby Chicks – Education Campaign
 - Following a number of multi-state outbreaks (included cases in North Dakota) of Salmonella associated with baby chicks, the NDDoH partnered with the North Dakota Department of Agriculture State Veterinarian's office to develop an educational campaign. Public news releases were put out along with the development of posters and Salmonella prevention cards. The educational materials were distributed to farm supply stores throughout North Dakota. The artwork and content were a collaboration between the two organizations. This is a sample of the collaboration.



- E. coli Associated with Attending a County Fair
 - The NDDoH was notified by a physician that was caring for three patients with shiga-toxin producing *Escherichia coli* (STEC) gastroenteritis. All three patients reported attending the same county fair before becoming ill. The NDDoH developed an online survey, questioning individuals about their attendance at the Red River Valley Fair and whether they went into any of the animal barns, saw or touched any of the animals, or ate any food served by food vendors at the fair, all of which could provide possible exposures to STEC. Five laboratory-confirmed E.coli O157:H7 isolates from five individuals who attended the fair matched by pulsed field gel electrophoresis (PFGE). Epidemiological analysis of survey data did not yield any association with a specific exposure and becoming ill. As a result, the NDDoH and the North Dakota State Veterinarian spoke at the 2016 State Fair Convention about the risk of disease transmission and how to mitigate the risk in fair settings.

- Enhanced Rabies Project with North Dakota Game and Fish and USDA Wildlife Services
 - On January 13, 2012, the North Dakota Department of Health (NDDoH) issued a news release regarding two skunks and an unvaccinated dog that were found to be positive for rabies in Bowman County since Nov. 28, 2011. These instances of rabies were considered to be unusual by the NDDoH because reports of animals testing positive for rabies generally are sporadic. Following the news release, three additional skunks tested positive from the Bowman area. As a result, the NDDoH has been working with the North Dakota Game and Fish Department and the USDA Wildlife Services to conduct enhanced surveillance and testing in this region. Enhanced surveillance for rabies continued for a number of years following this increase in 2011-2012. The NDDoH continues to collaborate with the North Dakota Game and Fish Department on rabies surveillance in hunter-harvested animals.

Methods

The goal behind the following objectives include ways to improve knowledge on various zoonotic diseases which would include information regarding transmission, prevention, detection, and monitoring of zoonotic diseases.

Objective One – Collaborative Development

<u>Activity</u>	<u>Completion Date</u>
Hire Student Intern	July 31, 2017
Meet with 4-H Youth Livestock Specialist	July 31, 2017
Meet with FFA Leaders	July 31, 2017
Develop stakeholder meeting	August 16, 2017

Funding is being requested for an influenza and zoonotic diseases student intern. This position will collect project data, assist with analysis and provide support for the evaluation. Additionally, the student will be responsible for coordinating and implementing the meeting efforts and establishing the stakeholder collaborative. This position will also maintain daily duties such as answering phones, filing, coordinating meetings, assisting with grant reporting, mailing supplies, ordering materials, etc. Finally, this position will develop a stakeholder website where trainings, education, and the strategic plan will be posted. This position will be supervised by the State Epidemiologist and will work closely with the influenza coordinator as well as the zoonotic coordinator.

One of the initial tasks will be to travel to 2-4 surrounding fairs (state fair, larger county fairs, etc.) to evaluate their current animal barns. The intern will be responsible for identifying hand washing signage, hand washing stations and information about barn safety, etc. This will be used as the baseline, so in the summer of 2018, following the education, we can compare the education improvements at the same fairs.

Additionally, meetings will be established with the state 4-H programs as well as FFA in order to determine needs among their youth. These needs may include in-person trainings, on line trainings such as those developed by Iowa State University (<http://www.cfsph.iastate.edu/YouthInAg/>). It may also be beneficial to work with the older participants in 4-H and FFA for them to become trainers.

Lastly, a statewide stakeholder meeting (summit) will be held. This group will include the State Epidemiologist, ELC program manager, influenza coordinator, zoonotic coordinator, 4-H leaders and FFA president. Additionally, the summit will also include the two largest universities (North Dakota State University and University of North Dakota), NDSU Extension Services, Local Public Health Units, NDDoH Division of Microbiology, the BOAH, and the ND Association of Fairs.

The summit will be used to develop a strategic plan framework for education implementation as well as to identify long- and short-term education goals for the collaborative.

Objective Two – Training Activities

<u>Activity</u>	<u>Completion Date</u>
Iowa State University online training	May 1, 2018
MN Fair posters/placards/postcards	June 1, 2018
Georgia 4-H <i>Friends</i> Magazine	June 1, 2018

Funding is requested for the training. While the summit stakeholders will develop the strategic plan for training and education needs, initial trainings for youth groups would include:

1. Work with the ND FFA and 4-H boards during the fall and spring, to hold workshops and trainings among the groups utilizing the Georgia information as well as the Iowa State trainings to reinforce safety information. Rural FFA and 4-H members will be trained to that they could present this information to grade school, junior high and high school classrooms to help raise awareness among fair attendees.
 - a. These workshops can be done via webinars and video conferencing to allow for collaborations across state lines, specifically, South Dakota, Montana and Wyoming. These states are similar to North Dakota in regard to population size, urban/rural landscape, and farming/ranching economy.
 - b. Additionally, contacts from Saskatchewan and Manitoba could participate in these trainings as well. The northern cities (Grand Forks and Minot) in North Dakota see many Canadian visitors.

The overall purpose of the collaborative is to identify additional training needs, ideas, and implementation. The goal is to identify activities that can be maintained over the years. Enrolling FFA and 4-H members in train-the-trainer programs would allow continued trainings over time and allow the NDDoH and youth programs to maintain a collaborative relationship.

Funding will be used for transportation, food and lodging for trainers, electronic tablets, printings, and mailings. Additionally, some funds will be made available to rent training rooms and ensure meeting supplies (paper, pens, tape, etc.) will be available.

Objective Three – Summit

<u>Activity</u>	<u>Completion Date</u>
Invite MT/SD/WY to Summit	July 21, 2017
Hold Summit	September 29, 2017
Finalize minutes and initial summit report	October 31, 2017

In July, the newly-hired intern will begin working with 4-H, FFA, and the state veterinarians to begin collecting some basic training needs information. They will work to gather baseline data to bring to the Summit to provide information that is available to start the strategic planning. This may also identify information that is not available to help in planning what is needed.

The ND State Epidemiologist will reach out to the Minnesota Department of Health to be a possible speaker at the stakeholder meeting. The speaker would be able to offer insight, lessons learned, and improvement ideas on the postcards and posters.

After the Summit, objectives identified as needed through the strategic planning process, will begin to be collected. Workgroups will be developed to address different areas. We will work with the ND Association of Fairs to determine distribution efforts for the posters as well as postcards. Stakeholder input on evaluations, surveys, and educational materials will be critical in order to produce the best results. At the end of the grant cycle, these materials will need to be maintained and updated and this will be done through the collaborative.

Objective Four – Evaluation

<i>Activity</i>	<i>Completion Date</i>
In-person training evaluation survey	August 31, 2017
Evaluation of online trainings and format	October 20, 2017
Development of fair survey evaluation	December 29, 2017
Evaluation of stakeholder's strategic plan	January 12, 2018
Finalize initial stakeholder report and send out	February 9, 2018

Various forms of evaluations will be needed throughout the process.

1. Using presentations already developed in-house by NDDoH on influenza and zoonotics, we will present to a variety of organizations (4-H, FFA, BOAH, Local Public Health Units, schools, etc.). These presentations will be preceded and followed by short evaluations to determine knowledge gained, accessibility, and future needs.
2. Utilizing the education materials online from Iowa, we will evaluate how well the training worked, whether FFA and 4-H members felt they gained knowledge from the material, and if this format worked well for them. We will also evaluate the time it took to complete training and any other accessibility issues.
3. Using printed materials already developed by other states regarding “safe fairs”, we will use Master of Public Health students to attend 6-8 of the larger fairs in the state. The students would randomly approach people leaving the fair barns to gather information on if they saw the information, if they were aware of possible disease transmission, if they washed their hands when leaving the barn, etc.
4. As part of the quality improvement process, the stakeholders will evaluate at the mid-year how the objectives of the strategic plan are being met, changes that need to be made, and identify help to overcome any roadblocks.

Deliverables

<i>Activity</i>	<i>Completion Date</i>
Hold Summit	September 29, 2017
Presentations to Youth Groups	October 31, 2017
Develop Strategic Plan	October 31, 2017
Trainings using University of Iowa website	January 31, 2018
Safe Fairs/Minnesota products	May 1, 2018
Train-the-trainers	June 1, 2018
Evaluation reports on all products	June 15, 2018

Project Timeline

North Dakota Department of Health Institutional Review Board

All research or studies conducted by employees of the NDDoH which involve human participants, must be reviewed and approved by the North Dakota Department of Health (NDDoH) Institutional Review Board (IRB) prior to beginning the project/research.

The evaluation surveys planned in this proposal will not collect subject identifiers (name, social security number, etc.), nor will the surveys collect health information. The goal of the surveys are to evaluate the training materials, the trainers, the visibility of the materials, accessibility of materials, and overall progress on the project.

According to the NDDoH IRB protocol, projects which do not need to be submitted to IRB include but may not be limited to:

- Projects which do not include human subjects;
- Survey or interviews where information collected is on protocols, opinions or best practices
- Projects using existing data from public sources

The ND State Epidemiologist acts as the NDDoH IRB Administrator. In the event that the State Epidemiologist is involved in the project, the project's final approval determination, in this case the final questions on the evaluations, will be moved to the NDDoH IRB Chair.