

**An analysis of different types of interstate
certificates of veterinary inspection**

by

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ABSTRACT

The ability to trace animals is important in the livestock industry especially when it comes to controlling and eradicating animal diseases. Since livestock production is such a large and economically important industry in Kansas, it becomes even more critical to protect that industry by controlling animal diseases. By having a strong traceability system in place, export markets experience growth because trade partners are confident in the quality of the livestock and livestock by products they would trade for. Interstate Certificates of Veterinary Inspection aid in the mission of being able to trace animals as animal movements occur.

The overarching goal of this thesis is to compare and contrast the benefits and costs associated with the different types of Interstate Certificates of Veterinary Inspection (ICVI): paper, electronic CVIs (eCVIs) offered through each state's department of agriculture, mobile ICVIs/AgView, GlobalVetLINK, Veterinary Services Process Streamlining, which is offered through USDA, and Vet Sentry. Information about background, features and costs of each type of ICVI will be discussed in detail.

The trends of electronic versions of ICVIs being used for import of livestock into Kansas are compared to how many paper ICVIs are still being submitted for imports. Headcounts of livestock, bovine (beef and dairy), bison, ovine, caprine, equine, porcine, poultry, and cervid, being imported into the state of Kansas are analyzed. Additionally, the time in process and processing times of ICVIs are determined for each type of ICVI that the Kansas Department of Agriculture (KDA) receives.

These data suggest that the majority of ICVIs are submitted through paper means, but that there is an increasing trend towards utilization of electronic versions. Processing

times of ICVIs submitted electronically are significantly less than those of paper versions. Especially in cases of numerous cattle that need to be individually identified, it proved to shorten the data entry time largely with the use of electronic ICVIs. This analysis should serve as a basis for a move towards all ICVIs being submitted electronically to lessen the time it takes to respond to an emergency in which livestock movements need to be traced.

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CHAPTER I: INTRODUCTION

The ability to trace animals is critical in the quest to control and eradicate livestock diseases. In the case of a disease outbreak, it becomes very important to trace back to where the infection started, and to trace forward to where exposed animals moved, possibly exposing other animals. The source of infection can be determined through the availability of records that detail individual animals as they move through the country. Promptly tracing the source of infected herds and animals that were exposed during an outbreak heightens the effectiveness of emergency response, and lessens the social, economic and environmental costs (Portacci, et al. 2013).

1.1 Background

Tracing animal movements begins with detecting an infected animal or herd and aims to identify all animals that could have been exposed before (Trace-Forward) or after (Trace-Out) the infected animal joined the herd. The Interstate Certificate of Veterinary Inspection (ICVI) is vital to assisting in the traceability of animal movements between states. An ICVI is an official document that can be signed by either an accredited veterinarian or official state or federal veterinarian. ICVIs are commonly referred to as “health papers” though it only requires that the veterinarian verify that the animal (or group of animals) appears healthy and has no signs of any communicable diseases when inspected. Generally, each state requires ICVIs for movement of animals into their state. This is especially important in livestock species, unless animals are moving directly to a livestock market or to slaughter. Kansas requires an ICVI for any animal being imported for purposes other than slaughter or direct to a public livestock market. Even though ICVIs do not guarantee an animal movement occurred, as the shipment could be cancelled, they

do provide the only source of information about the origin and destination of potentially infected animals that moved across state boundaries. Animal traceability is dependent on the accurate recording of this information on the ICVI. The process for using ICVIs requires the accredited veterinarian to inspect the animals to be shipped, include complete origin and destination addresses, provide any necessary identification of animals and any statements required by the state of importation, and make sure the origin state receives a copy that can be forwarded to the destination state.

1.2 Foot and Mouth Disease

One of the most economically important diseases that Kansas invests resources to protect itself from and be prepared for is Foot and Mouth Disease (FMD). According to the USDA (2018), FMD is a severe, highly contagious viral disease. The FMD virus causes illness in cattle, swine, sheep, goats, deer, and other cloven hoof animals. Once an animal is infected with FMD, the clinical signs begin to appear within 2-14 days. The virus can survive in living tissue and as well as breath, saliva, urine, other excretions of infected animals. If the right conditions exist, it can also survive in the contaminated materials and the environment for several months. There are seven known types and 60 subtypes of the FMD virus. Immunity is dependent on each type, so having immunity to one does not mean that an animal will be immune to all types (USDA APHIS 2013).

It is important to consider the possibility of an FMD outbreak due to its ability to rapidly spread which in turn leads to large economic losses. Foot and Mouth Disease causes losses in production and can lead to producer hardships, especially for those raising livestock. Another serious consequence of FMD is that it has a significant impact on livestock trade; a single detection of the disease will likely halt international trade for a cloven hoof livestock and products for a significant period of time. The world prices for

beef and cattle that originate from countries where FMD is prevalent are drastically lower than those in countries free from FMD. A premium of 50-60% is expected for FMD-free fresh meat (Jones 2010).

In 2017, U.S. beef exports reached a record high of values exceeding \$7 billion. Beef exports were 2.8 billion pounds, which was up by 6% from the previous year. This was the fourth-largest volume recorded and the second-largest since BSE (Jackson 2018). With current beef export demand, it becomes even more important to protect this industry through accurate and efficient traceability of livestock.

In the event of a FMD outbreak in the United States, there would be a stop movement order put into place, meaning that animals would no longer be able to move to avoid the risk of the disease continuing to spread. This would include animals moving into Kansas as well as movement of animals within Kansas. The economic impacts to Kansas could be significant. According to Pendell et al. (2007), a FMD outbreak in Kansas could result in losses to the Kansas economy of \$1 billion. The economic impacts would be especially hard on rural communities with feedlots and slaughter plants because their main economic driver would shut down for an unspecified amount of time. Another important consideration is that when the stop movement ends, there will be a glut of animals that were scheduled to be slaughtered during stop movement that need to be worked into the plants schedule; implying that the cattle processing would be behind. This could take a great deal of time and require more employees and working continuous shifts to catch up.

1.3 Other Diseases and Natural Disasters

There are other factors that the use of Interstate Certificates of Veterinary Inspection is beneficial to the tracing of animals. In the event of any other communicable disease spreading, the ability to trace animals to the origin and destination of movements

allows the intervention to begin more quickly and efficiently. This practice has proven to be beneficial in both cases where Tuberculosis and Trichomoniasis are spread through interstate animal movements. Tuberculosis (TB) is primarily found in cattle, but has the ability to transfer to any warm-blooded animal. The disease is a contagious, chronic bacterial disease caused by *Mycobacterium bovis*. Though the disease primarily includes the lungs, it can migrate to other organs. Unfortunately, animals are rarely detected until they have reached an advanced stage because they do not normally show clinical signs until that point (USDA APHIS 2014). Trichomoniasis is a venereal disease caused by the protozoan, *Trichomonas foetus* (T foetus) that effects cattle typically causing abortions and infertility, contributing to extended calving intervals. T foetus can be found in the reproductive tracts of cattle. When an infected bull is bred to a cow naturally, 30% to 90% of the exposed females can become infected (Janzen n.d.). Natural disasters such as floods, tornados and winter weather are all cases when being able to trace where livestock originated from becomes of upmost importance. The use of ICVIs can aid in tracing animals in both types of situations.

1.4 Import ICVIs in Kansas

Being able to efficiently trace animal movements in a short amount of time will lead to quicker detection in the event of an FMD infection. If FMD can be detected sooner, then there should be less chance that it is spread, and this will cut down on the economic impact of having an FMD outbreak (Pendell, 2006). Interstate Certificates of Veterinary Inspection are the main source of information to determine when and where animal movements occurred.

In the state of Kansas, there are six forms of ICVIs currently accepted for animals imported into the state. This includes the paper form issued by the origin state's department

of agriculture as well as five different electronic versions offered. These include electronic ICVIs offered through state departments of agriculture and four others offered through other organizations or companies, which include GlobalVetLINK, Veterinary Services Process Streaming (VSPS), AgView, and Vet Sentry.

Not only is accurate information with ICVIs important, but also timeliness of receipt of this information. Because FMD is highly contagious and effects food animal species, it is critical to have earlier detection in the case of disease. Paper ICVIs have become more of a historical document as they have a lifespan of 30 days from inspection date; implying an animal may not move until nearing the end of that period and it takes considerably more time for a paper ICVI to reach the destination state's office. With the introduction of electronic ICVIs, it has become much easier and faster to get animal movement data recorded and in a usable form for animal disease traceability.

1.5 Objective

The overarching goal of this thesis is to compare and contrast the benefits and costs associated with the different types of Interstate Certificates of Veterinary Inspection (ICVI): paper, electronic CVIs (eCVIs) offered through each state's department of agriculture, mobile ICVIs (mCVI)/AgView, GlobalVetLINK, Veterinary Services Process Streamlining (VSPS), which is offered through USDA, and Vet Sentry. I will detail the background, features and costs of each type of ICVI.

The trends of electronic versions of ICVIs being used for import of livestock into Kansas is compared to how many paper ICVIs are still being submitted for imports. Headcounts of livestock, bovine (beef and dairy), bison, ovine, caprine, equine, porcine, poultry, and cervid, being imported into the state of Kansas are analyzed. Additionally, the

time in process is determined for each type of ICVI that the Kansas Department of Agriculture (KDA) receives.

1.6 Organization of Thesis

The remaining components of the thesis will include a review of literature in Chapter 2. Chapter 3 will describe the methods used in this study. Chapter 4 will provide a detailed discussion of the data used in this thesis. Chapter 5 will include conclusions and suggestions for further research into the topics of this thesis.

CHAPTER II: LITERATURE REVIEW

This chapter provides an overview of the pertinent literature. In the first section, the types of ICVIs are discussed in detail. This is followed by a brief discussion on the importance of utilizing ICVIs, as well as a comparison of electronic records to paper as utilized in the medical field.

2.1 Types of Interstate Certificates of Veterinary Inspection

Interstate Certificates of Veterinary Inspections are important to the quest of protecting animal health in the United States. ICVIs are used by states to oversee the movement of animals into and out of their state, respond to animal health issues and enforce the regulations set out. The primary use of ICVIs is to document the health status of animals and to have strong traceability. The test results and observations presented on ICVIs help states to make sure disease is not spread.

ICVIs, or more commonly known as health certificates, are official documents issued by accredited veterinarians stating that they have inspected the animals listed and are found to meet the guidelines for their intended movement. International and interstate movement require CVIs, but many in-state events such as fairs and trail rides also require them.

The health certificate verifies that animals meet specific health requirements, but it also includes information about when the animals were inspected, species, age, origin, destination and purpose of movement of those animals. Depending on that information, there may be certain tests, treatments, or vaccinations that are also required before the ICVI can be completed and deemed official.

Each state has different import regulations so it is important to verify the regulations with the destination state. In Kansas, import regulations are listed on the Kansas

Department of Agriculture website or can be obtained by calling the import permit desk. Some animals require permit numbers to be transported into the state and these permit numbers are to be included on the ICVI for the shipment. All animals require an official ICVI to be issued within 30 days prior to movement into Kansas unless the animals are moving to an approved slaughter facility or to an approved livestock market.

Beef cattle that are being imported for breeding purposes are required to be individually identified with an official USDA ear tag or breed registration number and tattoo listed on the ICVI. Intact females require one of the following Trichomoniasis statements: 1) this female is a known virgin, 2) this female is at least 120 days pregnant, 3) this female has only been exposed to certified Trichomoniasis negative bulls, 4) this female has been sexually isolated for at least 120 days, 5) this female was artificially inseminated with no bull exposure, 6) this female has a calf at side and has had no bull exposure since calving, 7) this is an embryo transfer associated movement, or 8) the female will have no bull exposure after entering Kansas. Bulls that are less than 18 months of age require a statement that they have never been exposed to breeding age females. If a bull is over 18 months of age or has been exposed to females, they require a negative Trichomoniasis test within 60 days of movement listed on the ICVI. Bison being imported into Kansas are treated the same as beef cattle other than they do not require any Trichomoniasis testing.

Beef cattle that are entering Kansas for feeding purposes typically require less identification and do not require any testing. Steers and heifers that are under 18 months of age require the sex, a headcount, and the average age or weight to be listed on the ICVI. Heifers also require a statement that they are entering the state for feeding purposes only and will have no bull exposure after entering Kansas. Bulls that are under 18 months of age

entering for feeding require a statement that they are entering for feeding purposes only with no diversion or that they are castrated upon arrival. Any beef cattle that are entering Kansas for feeding purposes that are 18 months of age or older require official USDA identification to be listed on the ICVI.

Beef cattle entering Kansas for exhibition purposes require individual official identification listed. Beef calves that are less than 60 days of age entering Kansas without their mothers require an individual official identification to be listed and a movement permit obtained from Kansas Department of Agriculture, Division of Animal Health.

All dairy cattle are required to be individually identified with an official USDA ID and to have a permit number. Females entering for breeding purposes also require a negative TB test if they are six months of age or older within in 60 days of movement and a Trichomoniasis statement if they are 12 months of age or older. Dairy bulls that enter the state require a negative TB test if they are six months of age or older and a statement that they have never been exposed to breeding age females or a negative Trichomoniasis test if they are over 18 months of age.

Dairy animals entering Kansas for exhibition require an individual official ID, a negative TB test within 60 days, and a permit. Steers and spayed heifers entering for feeding purposes require a statement of individual official identification, the headcount, average age or weight listed and a permit.

Any cattle or bison that originate from the Designated Surveillance Area (DSA) for Brucellosis, that includes portions of Idaho, Wyoming and Montana, require individual official identification to be listed and a permit number. If they are sexually intact animals

12 months of age or older they also require a negative Brucellosis test within 30 days of movement.

Cattle entering the state that originate from Canada or Mexico require individual official identification in their left ear, a permit identification number and country related identification. For Mexican cattle this includes an “M” brand and for Canadian cattle this includes a “CAN” tattoo in the ear or a “CAN” brand on their right hip.

Other livestock species have their own requirements. Some are dependent on whether the animals are entering Kansas for exhibition purposes. For example, swine require a permit and if they are entering for exhibition, they require individual official identification whereas if they are entering for non-exhibition purposes a group identification is acceptable. Equine require identification which can be a description of the horse as well as a negative Coggins test within the last 12 months. If the test is not attached then the laboratory, date, and accession number are required to be on the ICVI. Sheep and goats entering for exhibition purposes are required to have individual scrapies tags listed and animals entering for other purposes are allowed to enter with a flock identification number. Camelids, which includes Alpacas, Llamas, and Camels, are required to have individual identification or a description of the animals. Ratites, which include Ostriches and Emus, require individual identification. Cervid, which include Deer, Antelope, Elk, have numerous requirements. Cervid animals need to be individually identified, they must originate from a farm that has been part of the Chronic Wasting Disease (CWD) program for at least five years, must be imported to a destination that is enrolled in Kansas’ CWD program. The origin needs to have been accredited as Tuberculosis and Brucellosis free and animal movements require a permit. Poultry’s requirements are dependent on whether they

are enrolled in the National Poultry Improvement Plan. If it is a single movement then an ICVI or 9-3 form need to be completed, birds need to have a pullorum typhoid done within 90 days and they require a permit. Any rodeo stock also require a permit number as well as the regular requirements for the species.

The paper version of these forms is the traditional method of getting this information to the intended source. The paper system lacks some key elements as it creates a delay in between animal movement and distribution of the document, and it can be difficult to retrieve data in a timely, efficient manner when necessary. To address these issues, several electronic forms have been created which are discussed below.

2.1.1 Paper CVI

In many states, including Kansas, paper ICVIs are still used. In Kansas, paper ICVIs are sold by Kansas Department of Agriculture's Animal Health Division for \$40 per book of 25 ICVIs. These books include an original with two carbon copies of each certificate. This allows one copy to be sent with the owner or person transporting the animals, one copy to be sent to the state animal health office and one copy for the veterinarian's office. Paper ICVIs are typically harder to read than electronic versions and have a tendency to be delayed due to having to mail the form to the state Department of Agriculture office and it needing to be scanned and forwarded to the destination state. An ICVI is valid for 30 days from inspection date, and is to be forwarded to the origin state within seven days of issue, and the origin state has seven days to forward it to the destination state. This illustrates that information can be delayed greatly between when animals arrive and when the information is received.

2.1.2 eCVI offered through State Departments of Agriculture

Many states, as well as the Kansas Animal Health Division, have worked together and now offer veterinarians in their state an electronic CVI (eCVI). This form is a fillable PDF that looks very similar to the paper CVI. It allows the veterinarian to complete the form efficiently with drop down menus and digital signatures for ease of completion. These forms can then be emailed directly to the state animal health department upon completion, which speeds up the timeliness of receipt of the information. The origin state will forward this eCVI onto the destination state; typically the same day they receive it, but they have up to seven days to complete the forwarding. The eCVIs are programmed such that the information is easily extracted and upload able without further data entry into animal health disease traceability databases. This form is free to veterinarians in the State of Kansas, as is in most states.

2.1.3 mCVI/AgView

AgView owned by the National Pork Board, was originally a mobile app developed by the Institute for Infectious Animal Diseases (IIAD) in a partnership with the Texas Center for Applied Technology, a part of the Texas A&M Engineering Experiment Station. During the time of this study, it was called mCVI. The application allowed veterinarians to complete CVIs from a mobile device out in the field and send the information when connectivity was available. This application allowed for easy-to-use, touch-screen interface for digitally entering animal health certificate information. It had the capability to print paper-based forms from the app and to send copies through email. The CVIs could be automatically or manually imported into the origin and destination states' animal disease traceability databases. IIAD has now partnered with the National Pork Board and the new application is marketed under AgView. It includes the same features as mCVI did, but it

now can be used on a desktop also. The transition to AgView began in September 2018 and on January 1, 2019 a \$3 fee per AgView CVI began (Institute for Infectious Animal Diseases n.d.).

2.1.4 GlobalVetLINK

GlobalVetLINK (GVL) is a web-based software system that links veterinarians, animal owners and producers, diagnostic laboratories, animal health companies, feed distributors, and state animal health officials. Government regulations have continued to become more prevalent and through that, GVL has worked on producing digital solutions to assist in maintaining compliance of animal disease traceability and data management.

The official forms offered through GVL include; eCVIs, Veterinary Feed Directives (VFDs), veterinary prescriptions, Equine Infectious Anemia (EIA) or Coggins tests, and equine passports (GlobalVetLINK 2019).

The CVIs offered through GlobalVetLINK are an electronic form that is easily downloaded into origin and destination states databases. Veterinarians have to call the company to get individual pricing. GlobalVetLINK is offered for both livestock species as well as companion animals. Some features they offer include: auto-verification of state movement requirements, that are immediately submitted to the state animal health offices; provide animal owners online access to their documents; and an electronic Coggins form that can accompany the CVI (GlobalVetLINK 2019).

2.1.5 Veterinary Services Process Streamlining (VSPS)

Veterinary Services Process Streamlining (VSPS) is a service that is part of Animal and Plant Inspection Service (APHIS). The CVI is a free electronic version that services only livestock animals (not companion animals). With this version, it allows veterinarians to upload animal information with an Excel Spreadsheet or CSV file. Other benefits

include being able to create multiple CVI templates and certificate statements that can be saved for future use, store and access individual animal or group descriptions for quick data entry in future documents, processing of Coggins forms for numerous horses at once, and a feature that allows important information such as age, breed, sex and test results to be copied from one animal to the next.

State employees are able to use the VSPS system to view eCVIs destined for their state and accept or reject them based on whether they meet the state's import regulations. States can also include State Certificate statements that they require to be present on ICVIs received. Through the VSPS system, veterinarian accreditation status can easily be checked and which state(s) they are licensed in. This assists states in tracing animals, if questions arise (USDA, APHIS n.d.).

2.1.6 Vet Sentry

The Vet Sentry ICVI is an electronic format that looks very similar to a paper ICVI when completed, yet it is a user-friendly digital certificate that that can be filled out on a laptop or desktop. It allows users to tab from field to field for ease of data entry. The certificate is built on an Adobe PDF platform with many auto fill features. One feature that makes it user friendly for veterinarians is the ability to import data from an external source or quickly get RFID filled spreadsheets to import hundreds of animal IDs with only a couple clicks of the mouse. The Vet Sentry ICVIs are automatically sent to the origin and destination state officials as well as the issuing veterinarian. One very important aspect of this ICVI is that it is completely searchable to meet animal disease traceability standards. To sign-up for Vet Sentry, the veterinarian has to complete the registration process on their website which includes submitting information about their credentials such as their

accreditation number, state license number, state of license, and employer state and then creating a username and password.

The cost to use a Vet Sentry ICVI is \$3.00 per certificate or if the veterinarian preorders multiples they get a discount, they can order a group of 10 for \$25.00 or 100 for \$225.00. The purchase of the prepaid ICVIs is completed by filling in credit card information once the veterinarian has logged into the Vet Sentry portal (Vet Sentry n.d.).

2.2 Importance of Interstate Certificates of Veterinary Inspection

Animal identification (ID) and traceability systems are developing at a rapid pace throughout the world to protect animal health and strengthen export market growth. International animal health, food safety and world trade organizations have determined the importance of having competent animal disease traceability systems in place. In the United States, animal identification has been present in multiple forms for some time. Protecting animal health by eradicating and monitoring disease is important to maintain international trade. One of the ways that the United States can trace animals is with Interstate Certificates of Veterinary Inspection (Schroeder and Tonsor 2012).

The goal of traceability is to have the information detailing where an animal physically was and at what time. Traceability can or will eventually be used for: (1) confirming the origin and ownership of animals as to not misrepresent them and to hinder the theft of them; (2) surveillance, control and eradication of foreign animal diseases; (3) to safeguard against breaches of biosecurity in the national livestock herd; (4) to ensure compliance of international regulations of trade; (5) to maintain compliance of country of origin labelling requirements; (6) for advancement of distribution and delivery systems, supply-side management and inventory controls; (7) to promote value-based marketing; (8)

to promote value-added marketing; (9) to confine the source and breadth of quality-control and food-safety problems; and (10) to diminish product recalls and increase effectiveness of crisis management protocols (Smith, et al. 2005).

2.3 Electric records compared to paper records

Other industries have compared and evaluated paper and electronic records. In the medical field, the question of comparing electronic records to paper records has become a debated topic with research being conducted to determine how the quality compares. Paper-based documentation generally is regarded as not meeting the requirements of high-quality documentation and communication among healthcare providers, due to it being repetitive, inaccurate and time-consuming. Issues of obtaining information from paper documentation can arise because it is labor intensive. Since human health care is based upon and relies on high quality information, much like animal health, electronic documentation has been introduced. The electronic health records (EHRs) provides information that is more accessible and more legible. Nurses have used the EHRs to document the nursing process for tasks such as entering orders and accessing laboratory results, assisting healthcare professionals in processing, managing, and communicating data in a multitude of environments. Some benefits to the use of EHRs are the likelihood of improving patient's safety, enhancing the access of patient healthcare information to healthcare professionals, assuring the proper use of resources and developing greater communication among healthcare professionals. The implementation of EHRs is expected to vastly increase the accuracies of healthcare information used by healthcare professionals compared to the paper-based records (Akhu-Zaheya and Hani 2017).

“Documentation and contents of data within an electronic medical record (EMR) must be accurate, complete, concise, consistent and universally understood by users of the

data, and must support the legal business record of the organization by maintaining the required parameters such as consistency, completeness, and accuracy” (Abiy, et al. 2018, p.1). The research done in this thesis will add insight into the economic impacts that paper documentation impose on the effectiveness of receiving accurate, complete information in a timely manner and how this contributes to the efficiency of animal disease traceability efforts.

CHAPTER III: METHODS AND DATA

This chapter will discuss the data used in the analysis and the source of the data.

This will be followed by the how these data will be sorted and analyzed.

3.1 Data

The data used comes from reports that the Kansas Department of Agriculture's Division of Animal Health records and archives concerning imports of livestock into the state. There are two reports used for this research: Cooperative Agreements and CVI Import Search.

3.1.1 Cooperative Agreement Reports

The first set of reports used were completed for a Cooperative Agreement. These cover cooperative agreements for fiscal years 2014, 2015, and 2016. The information used from each report is the total number of livestock animals imported, total number of ICVI submitted for livestock animals imported into Kansas, and number and percentages of backlogged forms for each quarter. The reports are divided into each fiscal quarter with the fourth quarter for each year having a summary of total ICVIs and total livestock animal head counts for the entire year. The livestock animals considered for the report include bovine (beef and dairy), bison, ovine, caprine, equine, porcine, poultry, and cervid. The reason for excluding companion animals is that most economic implications would be based on large or livestock animals. Each cooperative agreement fiscal year is divided into four quarters, that include April through June, July through September, October through December, and January through March. The data used for this thesis begins April 2014 and runs through March 2017.

3.1.2 CVI Import Search Report

The CVI Import Search is another report that is run from the USAHerds database. USAHerds is the database that the Kansas Department of Agriculture's Division of Animal Health uses for disease traceability and surveillance. A CVI Import Search was performed to include all valid ICVIs by quarter, ran as the same quarters as the cooperative agreement; April through June, July through September, October through December, and January through March. The report includes the ICVI number, issuing country, issuing state, batch count (whether more than one ICVI was entered as one record), permit number if applicable, inspection date, receipt date, purpose of movement, species, type of ICVI, veterinarian information including name, phone number, and address, consignor name and address, consignee name and address, origin name and address, and destination name and address. This particular report is used to determine the time in process of different types of ICVIs. Time in process is measured in days from the date of inspection to the date of receipt, that indicates how long it would take to have the data usable in the event of an animal disease trace-out. Also inferred from this report is the total number of each type of ICVI.

3.1.3 Processing time

The final data used are a collection of processing times to upload each separate type of Interstate Certificate of Veterinary Inspection. These data are collected in house by Kansas Department of Agriculture, Division of Animal Health staff to compare the actual upload time of each type of ICVI and to compare the cost to the organization of having a full-time employee doing data entry versus a student worker completing data entry.

3.2 Methods

3.2.1 Processing Time

To determine the processing time (or time spent entering data) for each type of ICVI, an individual was timed while completing the data entry of multiple ICVIs. Only one type of certificate was completed at each setting. Groups of 10 ICVIs would be processed at a time and the time taken to complete all of them was recorded. There were sixty certificates of each type processed in total. The same person completed this process six times and the average time to upload each type and a statistical analysis is provided in Table 4.1. Only paper ICVIs and eCVIs were processed as GVL, mCVI, VSPS, and Vet Sentry all upload directly into the USAHerds database. All ICVIs require a compliance check to verify that all import requirements are met which the Import/Export Program Specialist performs by reviewing the document. This process is the same no matter which type of ICVI is being reviewed.

3.2.2 Species Represented on ICVIs

To determine the number of ICVIs that included each livestock species and to determine the headcount of each livestock species represented on ICVIs for import into Kansas, the information was sourced from the Cooperative Agreement reports. The main livestock species analyzed are Avian, Bison, Bovine, Caprine, Cervid, Equine, Ovine, and Porcine. Bovine includes both dairy and beef breeds, as this is not always easily distinguished in the reporting. Information detailing the total number of ICVIs received per species can be found in Table 4.2.

3.2.3 Backlog of Interstate Certificates of Veterinary Inspection

The number of ICVIs that are received, but sitting in files to be uploaded at the end of each quarter is discussed to give an understanding of how far behind data entry can get

between paper and electronic forms. Any electronic forms that come in that do not automatically upload into the USAHerds database are saved to the shared drive. Any paper ICVIs that come in the mail are then scanned and saved to the shared drive. Some paper ICVIs are scanned by the originating state and emailed to the destination state, so the actual scanning time is not included in the analysis as it could create a bias. The number of backlogged ICVIs is simply figured by taking a count of how many ICVIs are saved on the shared drive that have not yet been entered in the USAHerds database. Once an ICVI is entered into the database, it is then deleted from the shared drive so that it is not duplicated. This is a very seasonal figure as there are times when there are more interstate movements happening such as when calves are weaned and moved to feedlots and when there are more livestock shows. This can cause the entry of ICVIs to fall behind. Another reason that the entry of ICVIs can fall further behind is around the holiday season as the office is closed. This is explored and further discussed. Table 4.3 represents the percentage of paper versus electronic ICVIs that are backlogged per quarter.

3.2.4 Days in Process

To estimate the time from issue to receipt of each type of ICVI, the CVI Import Search is run by the cooperative agreement fiscal quarter to include any valid certificates for live animal. Next, it is then exported to Excel where a column was added containing a formula subtracting the inspection date from the receipt date. This provided the number of days between the certificate being produced and the receipt of it by the Kansas Department of Agriculture. A statistical analysis including mean, median and standard deviation for days in process of each type of ICVI is provided in Tables 4.4 through 4.6.

3.2.5 Number of Interstate Certificates of Veterinary Inspection

To determine the number of each type of ICVI, the CVI Import Search was run that produces an Excel workbook. From this, the small or companion animal CVIs were removed by sorting the species column for canine, feline, and exotic. Only livestock species were kept, that included bovine (beef and dairy), bison, ovine, caprine, equine, porcine, poultry, and cervid. Next, these data were sorted by the CVI # for easier filtering and to look for duplicate numbers. Additionally, the number of each type of ICVI is obtained by quarter and provided in Table 4.7.

CHAPTER IV: RESULTS

4.1 Results

These results are drawn from the use of the Cooperative Agreement Reports, the Import CVI Search Reports, and the reporting of a full time staff member entering ICVI data to determine processing times.

4.1.1 Processing Times of each type of ICVI

The processing times of each ICVI were analyzed to determine the cost to the Kansas Department of Agriculture's Division of Animal Health of different types of ICVIs and to determine whether it is more beneficial in terms of cost to the organization to have a student worker complete the data entry than a USAHerds Program Specialist. This is a full time employee who works with the database system, completing the data entry of ICVIs. Some other factors are considered such as the attentiveness of the student as to avoid human error in reporting and whether the information is sensitive and should be kept private. There were two types of ICVIs processed; paper versions and electronic (eCVIs). The reason that only these two were accessed is because the other forms are directly uploaded into the USAHerds database. There were six batches of 10 (for a total of 60) of each paper and eCVIs data entered by the Import/Export Program Specialist through the data entry assistance program utilized in the Kansas Department of Agriculture's Division of Animal Health. The total time to enter 60 eCVIs was 43 minutes and 34 seconds, which was an average of 43.6 seconds per ICVI. The time taken to enter 60 paper ICVIs was 3 hours, 52 minutes 25 seconds, which averages to 3 minutes 52.4 seconds per paper ICVI. This is somewhat variable on the length and complexity of the certificate as some include multiple pages with numerous animal IDs that need to be entered. For example, there are paper ICVIs for dairy cattle that include up to 300 animal identification numbers to be hand

data entered. Taking into account that a full time employee is paid \$15 hourly as well as is offered a benefits package, whereas a student is paid \$10 hourly with no benefits, it makes sense to have students data enter the paper certificates. For instance, in one hour 15 ICVIs could be completed, it would cost \$0.65 per ICVI for a student to complete them, whereas it would cost \$0.97 per ICVI for a full time employee to complete the data entry. If data entry were behind, it would be beneficial to have all available employees completing ICVI data entry in the event that there was a need for a trace.

Table 4.1: Processing Times of Each Type of ICVI represented in Minutes: Seconds

ICVI Type	Data Entry	Mean	Median	Std. Dev.
Paper	03:52.4	03:52.4	03:17.8	01:53.0
eCVI	00:43.6	00:43.6	00:37.5	00:14.8
GVL		Auto Upload		
mCVI		Auto Upload		
VSPS		Auto Upload		
Vet-Sentry		Auto Upload		

4.1.2 Species Represented on ICVIs

The main livestock species were analyzed to determine the total number of ICVIs that represent each of the species: Avian, Bison, Bovine, Caprine, Cervid, Equine, Ovine, and Porcine. Bovine includes both dairy and beef breeds, as this is not always easily distinguished in the reporting. As one would expect, bovine imports into the state are by far the highest species count and highest number of ICVIs received. In Cooperative Agreement Fiscal Year 2014 (April 2014-June 2014), 86.13% of ICVIs received were for bovine, with the next largest group being equine at 8.98%. Table 4.2 below represents the percentages of ICVIs that include each species.

Table 4.2: Total Number and Percentage of ICVIs received per Species, April 2014-June 2014

Species	Total# ofICVIS	% ofICVIS
Avian	17	0.19%
Bison	35	0.40%
Bovine	7530	86.13%
Caprine	72	0.82%
Cervid	15	0.17%
Equine	785	8.98%
Ovine	68	0.78%
Porcine	221	2.53%

4.1.3 Percentage of Backlogged Forms

The percentage of backlogged forms is simply a measure of how many ICVIs were received into the Kansas Department of Agriculture office and not yet entered into the USAHerds database. This creates a delay in traceability should a trace need to be completed. The number of imports was accessed for each quarter. Rather than divide out into each ICVI type, Table 4.3 compares all electronic forms to paper.

Table 4.3: Number of and Percentages of Backlogged ICVIs, Electronic vs. Paper, April 2014-March 2017

Year	# Electronic	# Paper	% Electronic	% Paper
FY2014 Q1	1407	4386	24%	76%
FY2014 Q2	1688	3186	35%	65%
FY2014 Q3	2373	3953	38%	62%
FY2014 Q4	2099	2801	43%	57%
FY2015 Q1	2258	5240	30%	70%
FY2015 Q2	802	2951	21%	79%
FY2015 Q3	1416	3417	29%	71%
FY2015 Q4	7152	0	100%	0%
FY2016 Q1	6210	0	100%	0%
FY2016 Q2	5442	0	100%	0%
FY2016 Q3	6484	580	92%	8%
FY2016 Q4	0	37	0%	100%

The average of backlogged forms for 2014 Cooperative Agreement Fiscal Year (April 2014-March 2015) is 35% comprised of electronic ICVIs and 65% comprised of

paper ICVIs. In the first quarter, the percentage of backlogged ICVIs is 24% electronic and 76% paper. In the second quarter, there are 35% electronic ICVIs and 65% paper backlogged ICVIs. In the third quarter, the percentage of backlogged ICVIs is 38% electronic and 62% paper. In the fourth quarter, the percentages are closer to being equal; the percentage of backlogged ICVIs is 43% electronic and 57% paper. This is likely due to the quarter falling right after one of the busier times of year and a time with many holidays, therefore less data entry is happening.

The average of backlogged forms for 2015 Cooperative Agreement Fiscal Year (April 2015-March 2016) is 50% comprised of electronic ICVIs and 50% comprised of paper ICVIs. The numbers reflect the same trend with a higher percentage of the backlogged ICVIs being paper. In the first quarter, there are 30% of ICVIs backlogged are electronic whereas 70% are paper. In the second quarter, the percentage of ICVIs that are backlogged is 21% electronic and 79% paper ICVIs. In the third quarter, 29% of ICVIs backlogged are electronic and 71% are paper. The fourth quarter actually is a different scenario as the backlog is electronic with no paper ICVIs.

The average of backlogged forms for 2016 Cooperative Agreement Fiscal Year (April 2016-March 2017) is 97% comprised of electronic ICVIs and 3% comprised of paper ICVIs. In the first quarter, only electronic ICVIs are backlogged. In the second quarter, all of the ICVIs that are backlogged are electronic. Paper ICVIs are more difficult to readily get information from and require more time to locate than searching through electronic files on the server therefore it is a priority to make sure paper ICVIs are uploaded as quickly as possible. In the third quarter, the trend continues with a higher percentage of backlogged ICVIs being 92% electronic and 8% paper. In the fourth quarter, the trend

reversed as all the backlogged ICVIs are paper. This is likely due to the quarter falling right after one of the busier times of year and a time with many holidays, therefore less data entry is happening.

4.1.4 Days in Process

The amount of time that it takes to get an ICVI to the Kansas Department of Agriculture's Division of Animal Health office is one of the biggest contributing factors to the amount of time it takes to complete an accurate trace of animals. If it takes multiple weeks to receive an ICVI and there is a health concern in that time period, there is no information about animal movements to base management decisions on. Unfortunately, the data reported for this component is not consistent so it is not feasible to have an accurate comparison. In theory, all electronic versions, excluding eCVIs, are to upload into the USAHerds database automatically or through a weekly batch upload. This would allow information to be readily available in the case that an animal/animals need to be traced. The information included in the CVI Import Search report for time in process is inconsistent as it has some bureau receive dates that are the same as the inspection date and many that are spread out. This could be that the years used bureau receive date was not automatically uploaded and it was then hand entered later with no set rule as to what it should be recorded as. In the future, it would be interesting to see if this information is more accurate and matches the expectation that these electronic ICVIs are in fact uploaded into the USAHerds database on a daily or weekly basis.

Table 4.4: Summary Statistics for the Days in Process of Each Type of ICVI, April 2014-March 2015

ICVI Type	Mean	Median	Std. Dev.
Paper	21.89	11.00	36.41
eCVI	18.74	2.00	34.08
GVL	56.53	38.00	46.43
mCVI	20.25	18.00	33.87
VSPS	7.08	3.00	9.76
Vet Sentry	12.75	7.00	16.88

Table 4.5: Summary Statistics for the Days in Process of Each Type of ICVI, April 2015-March 2016

ICVI Type	Mean	Median	Std. Dev.
Paper	14.67	8.00	30.03
eCVI	20.09	9.00	31.69
GVL	17.73	18.00	9.02
mCVI	27.45	13.00	37.61
VSPS	1.90	1.00	3.27
Vet Sentry	18.68	12.00	36.00

Table 4.6: Summary Statistics for the Days in Process of Each Type of ICVI, April 2016-March 2017

ICVI Type	Mean	Median	Std. Dev.
Paper	10.71	6.00	27.50
eCVI	30.16	26.00	36.98
GVL	54.33	56.00	30.13
mCVI	16.53	10.00	20.37
VSPS		No Data	
Vet Sentry	18.47	15.50	18.43

4.1.5 Total number of ICVIs of each type

This comparison includes comparing the six specified types of Interstate Certificates of Veterinary Inspection: Paper, eCVI, GVL, mCVI, Vet Sentry, and VSPS. The total number of ICVIs are ranked Paper, GVL, mCVI, eCVI, VSPS and lastly Vet-Sentry. The mean, the median, and the standard deviation of number of ICVIs submitted over the period from April 1, 2014-March 31, 2017 is in Table 4.7. This information was

calculated from each quarter's counts. Figure 4.1 represents the proportion of each type of ICVI over each of the 12 quarters analyzed starting in April 2014 and going through March 2017. The most notable change is the increase in the number of mCVIs utilized. One reason for this could be the accessibility of the certificate being available on a mobile app, that does not require carrying a laptop around. This is especially convenient for veterinarians working at sale barns that need to write multiple ICVIs quickly and efficiently after a sale.

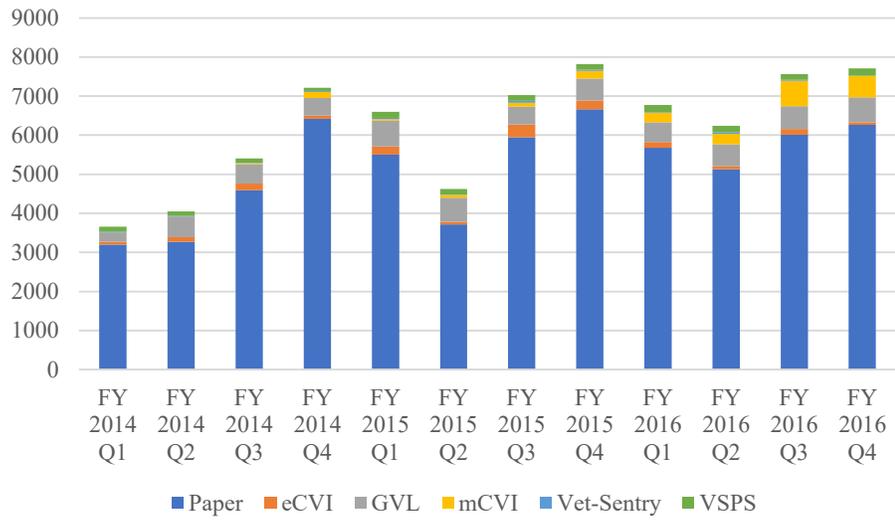
Table 4.7: Summary Statistics for the Number of ICVIs submitted from April 2014-March 2017

ICVI Type	Mean	Median	Std. Dev.
Paper	5197.75	5592.50	1175.84
eCVI	144.17	133.50	77.59
GVL	524.75	540.50	103.97
mCVI	191.50	122.50	203.46
VSPS	144.17	147.50	29.15
Vet-Sentry	21.42	21.00	12.11

Table 4.8: Total Number of Each Type of ICVIs Issued Each Quarter

Year	Paper	eCVI	GVL	mCVI	VSPS	Vet Sentry	Total
FY2014 Q1	3,196	72	247	0	131	13	3,659
FY2014 Q2	3,267	125	525	0	116	17	4,050
FY2014 Q3	4,590	172	498	18	115	8	5,401
FY2014 Q4	6,415	82	460	148	81	29	7,215
FY2015 Q1	5,503	206	657	46	158	30	6,600
FY2015 Q2	3,718	66	613	73	149	5	4,624
FY2015 Q3	5,945	330	463	97	146	41	7,022
FY2015 Q4	6,657	235	556	197	154	26	7,825
FY2016 Q1	5,682	142	501	250	186	17	6,778
FY2016 Q2	5,126	85	557	271	159	41	6,239
FY2016 Q3	6,013	147	583	651	145	25	7,564
FY2016 Q4	6,261	68	637	547	190	5	7,708
TOTAL	62373	1730	6297	2298	1730	257	74685

Figure 4.1: Proportions of each type of ICVI April 2014 – March 2017



CHAPTER V: CONCLUSIONS

5.1 Summary

The information used for the analysis in this thesis is drawn from two main reports and the recording of an USAHerds Program Specialist accessible through the Kansas Department of Agriculture's Division of Animal Health. The two reports used are Cooperative Agreement Reports and the CVI Import Search Report that is run from the USAHerds database. The data compiled from a USAHerds Program Specialist at the Kansas Department of Agriculture is a recording of how long it takes to process different types of ICVIs.

The first of the two reports used are the cooperative agreement reports submitted for cooperative agreement fiscal years 2014 through 2016, which covers a period beginning April 1, 2014 through March 31, 2017 totaling three years of data. The information is reported by quarter, April through June, July through September, October through December, and January through March. The information drawn from the cooperative agreement reports includes the number of livestock animals imported into the state of Kansas divided into the specific species and the percentage of paper versus electronic ICVIs that are backlogged at the time. Determining the total number of head of each species that includes: bovine (beef and dairy), bison, ovine, caprine, equine, porcine, poultry, and cervid, allows the ability to more fully understand Kansas' livestock import needs and aid in animal disease traceability efforts. Looking at the percentage of paper versus electronic ICVIs that are backlogged gives an indicator as to how accessible traceability data is at the point in time and how fast it could be pulled to complete a trace.

The second report, ICVI Import Search Report is a report that is exported from the USAHerds database that contains information about ICVIs recorded; it was run to match

each cooperative agreement quarter to maintain consistency. The information used from this report is the ICVI number, the batch count of each ICVI (whether there are multiple ICVIs for the record), the inspection date and the bureau receive date. By subtracting the inspection date from the bureau receive date, the total number of days could be found that allows the comparison of time in process between the different types of ICVIs. The other information utilized from the CVI Import Report is the total number of each type of ICVI that is recorded for import of animals into Kansas. By finding the total number of ICVIs of each type, trends can be interpreted to determine if more electronic forms are being used by veterinarians reporting the movement of animals within and into the state of Kansas.

5.2 Conclusions

5.2.1 Processing Times

It is concluded that it is more cost effective when electronic versions of ICVIs are used because they require less data entry or no data entry time due to the ability to quickly and efficiently upload them into the database. On average an eCVI takes 3 minutes, 8 seconds less to data enter through the data entry assistance program than a paper ICVI. As discussed, this time can vary greatly between paper ICVIs as some with numerous animal IDs as high as a few hundred can take up to 30 minutes or more to enter. By completing 60 of each record, it gives an accurate snapshot of how the processing time of both electronic and paper ICVIs is very different. ICVI types such as mCVI, GVL, VSPS and Vet Sentry that upload directly into the database are preferred even more as there is not any data entry required. Both mCVI, GVL and Vet Sentry upload each evening so there is only one day of delay from when they are submitted until when they are accessible in the USAHerds database, whereas VSPS ICVIs are uploaded as a batch at the beginning of each week. With all of these types, it is possible to log into their respective online databases and pull

the information if it is required more quickly. Many dairy cattle are moved on GVL and VSPS health certificates since they require a permit number for import into the state of Kansas. There is at least a preliminary record available which includes the ICVI number, the species, the number of head, the origin of the shipment, the destination of the shipment, when the animals are inspected, and the inspecting veterinarian's information. This allows a quick search within the respective database to be able to find individual information about the animals in the shipment.

5.2.2 Species Represented on ICVIs

As expected, bovine imports into Kansas have the highest number of import ICVIs. This is due to the large number of feeding establishments and slaughter facilities in the state. Kansas is a large producer of beef and therefore it makes sense that there would be a significant volume of cattle moving into the state for beef production.

5.2.3 Percentage of Backlogged Forms

Looking at the results of the percentages of backlogged ICVIs over the course of three years; April 2014 through March 2017, in nine of the twelve quarters there is a higher percentage of backlogged health certificates that are paper. This is expected as paper certificates take more time to enter than electronic. It is interesting to see some quarters where 100% of the backlogged forms are electronic. This could be due to an effort to catch up paper ICVIs, as they are also harder to pull data from if they are not in the USAHerds database and having to be hand sorted through for information.

5.2.4 Time in Process

This information is important in determining the effectiveness of electronic versus paper ICVI use yet the results are not conclusive from the data available. The mean, median and standard deviation of the six types of ICVIs are recorded and presented. It

varies greatly between years reported for each type of ICVI and does not correspond to the process in which the different types of ICVIs are received.

It would be logical to assume that paper ICVIs have the longest time in process as they need to be written, sent to the origin state's Department of Agriculture's Division of Animal Health and then either scanned and emailed or the hard copies mailed to Kansas Department of Agriculture's Division of Animal Health, that could take multiple days to complete. The average time in process ranged from 10.71 days in cooperative agreement fiscal year 2016 to 21.89 days in cooperative agreement fiscal year 2014.

In theory, eCVIs are filled out at inspection and then immediately emailed to the origin state's Department of Agriculture's Division of Animal Health, that emails all the eCVIs they have received for the destination state that day to that states Department of Agriculture's Division of Animal Health. Therefore, at most this should take one or two days for Kansas Department of Agriculture's Division of Animal Health to receive eCVIs for imports into the state. The numbers recorded did not represent this, the days in process ranged from 18.74 to 30.16 that is more than paper ICVIs.

Because GVL ICVIs are uploaded directly into the USAHerds database within a day of the health certificate being completed, it does not make sense that there are upwards of 50 days reported between the inspection date and the bureau receive date for GVL health certificates. A portion of this misrepresentation could be due to veterinarians not completing the ICVI on the date of inspection, but rather waiting up to almost 30 days when animals may actually ship out. Another possible reason could be that there was an error in the system where bureau receive date was not being reported when the ICVIs were uploaded and dates were manually entered at a later date with that day's date recorded.

In line with the other types of ICVIs, that flow directly into the USAHerds database mCVIs should have a short time in process yet this was not represented in the dates reported in USAHerds. They range from 16.53 days to 27.45 days, which once again is over the days reported for paper ICVIs in process.

Since VSPTS ICVIs are similar to GVL in that they are automatically uploaded to the USAHerds database, though it is completed weekly rather than daily, it would be expected that the numbers would reflect this. In the last year of data, there are no received dates listed so there could not be a fair comparison made.

The time in process represented for Vet Sentry ICVIs is inconsistent with the standard deviation ranging from 16.88 days to 36.00 days. There are a minimal numbers of Vet Sentry ICVIS used, which also leads to the statistical analysis being inconsistent.

Overall, the results for the processing times of different types of ICVIs were inconclusive. The processing times for paper ICVIs were likely the most accurate, but due to the electronic versions having skewed data a proper comparison cannot be noted. In future research into this area, it would be beneficial to ensure errors in reporting have not been made. Since the time that this data was recorded, there have been efforts to ensure consistent reporting of all import ICVI data, especially bureau receive dates.

5.2.5 Total number of ICVIs of each type

Paper ICVIs are still the major source of import data yet there is a trend representing an increase in the number of electronic ICVIs being submitted for the importation of livestock animals into Kansas. At the beginning of the data used, the total number of ICVIs for the quarter is 3,659 and of those 3,196 are paper, which means that there are only 12.65% of total ICVIs submitted that are electronic. Over the course of the three years of data, the percentage of electronic ICVIs submitted reached a high of 20.51%

in the third quarter of cooperative agreement fiscal year 2016 (October – December 2016). Overall, there is a positive trend towards a higher rate of ICVIs submitted being electronic versions rather than paper.

5.3 Future Considerations

The data recorded and analyzed for this thesis provides some meaningful insight into the comparison of the different types of Interstate Certificates of Veterinary Inspection that are submitted to the Kansas Department of Agriculture's Division of Animal Health. It can be used to make management decisions about pricing of Paper ICVI books, student work initiatives and promotion of eCVI versions to veterinarians. Though this is a comparison of import health certificates, Kansas exports likely have very similar trends. By analyzing this data and knowing how information is received and processed, the Kansas Department of Agriculture's Division of Animal Health can work with other states to cooperatively promote the utilization of eCVIs offered through their state and other electronic ICVI forms. One way that they can discourage the use of paper ICVIs is by increasing the cost to the point that it costs more to complete a paper copy than using an electronic form. There could be a push by all states to make this move.

Other information that could be analyzed in further research would be looking at which states import the most animals into Kansas, determining the time it takes to trace animals whether they are on a paper ICVI or an electronic ICVI and which factors affect how veterinarians choose which type of ICVI to use. All of this information leads back to the main reason that ICVIs are so important, their importance in being able to quickly and efficiently trace animals in the event of an animal disease outbreak to ensure prevention of it being spread further.

To understand what effects veterinarians' decisions to use certain types of ICVIs, conducting a survey would be beneficial. This survey could be issued in a number of different ways: phone conversations as veterinarians call into the Kansas Department of Agriculture's Division of Animal Health or as outreach, in person as state veterinarians interact with veterinarians in the field, as an email outreach with a link to fill out online, and as a paper copy sent to a sampling of veterinarians. The information collected would be about the factors that are important to veterinarians when picking a version of ICVI to use, asking about their familiarity with electronic versions, if there are limitations that are keeping them from using an electronic version and listing what factors would make them decide to use an electronic version. If a veterinarian is concerned about cost only, then the eCVI or VSPS would be suggested. If the veterinarian is concerned with accessibility in the field and does not want to have to carry a laptop, then AgView could be suggested. If they need a full service that includes features such as the ease of filling out a Coggins test form as well, then the GlobalVetLINK could be recommended. Likely, many veterinarians do not use an electronic version simply because they are unaware of their options or have the concern that they will not have access in the field so outreach that teaches them about the features, costs and benefits would aid in veterinarians potentially switching to an electronic form. Accessibility should not be a concern as the forms can be saved and then sent when internet or cellular service is available.

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