



Examining Need, Capacity, and Barriers to Accessing Food Animal Veterinary Services in Underserved Areas of Rural Ontario

Final Report

Funding Source and Research Team

Funding Provided By:

Special Initiatives Program - Ontario Agri-food Innovation Alliance
Ontario Ministry of Agriculture, Food, and Rural Affairs

March 22, 2022

Prepared By:

Steven Roche, MSc, PhD,
Director and Principal Consultant,
ACER Consulting

Minerva Cancilla-Styles, MSc
Rural Planning and Development,
University of Guelph

Sara Epp, MA, PhD,
Assistant Professor,
School of Environmental Design and Rural Development, University of Guelph

David Kelton, DVM, MSc, PhD, FCAHS
Professor | Dairy Farmers of Ontario Research Chair in Dairy Cattle Health
Department of Population Medicine, University of Guelph

Additional Graduate Research Support Provided By:

Alex Boekestyn, MSc Candidate, Rural Planning and Development
Pooneh Derakhshan, MPlan, Rural Planning and Development
Kaleigh Vanbokhorst, MSc, Rural Planning and Development

List of Abbreviations

BFO	- Beef Farmers of Ontario
CFO	- Chicken Farmers of Ontario
CVO	- College of Veterinarians of Ontario
DAVA	- Designated Area Veterinarians Association
DFO	- Dairy Farmers of Ontario
DVM	- Doctor of Veterinary Medicine
EFO	- Egg Farmers of Ontario
FBCC	- Feather Board Command Centre
MENDM	- Ministry of Energy, Northern Development, and Mines
NOFIA	- Northern Ontario Farm Innovation Alliance
NPAHN	- Northern Producers Animal Health Network
OABP	- Ontario Association of Bovine Practitioners
OAVT	- Ontario Association of Veterinary Technicians
OFA	- Ontario Federation of Agriculture
OMAFRA	- Ontario Ministry of Agriculture, Food, and Rural Affairs
OP	- Ontario Pork
OSCIA	- Ontario Soil and Crop Improvement Association
OSF	- Ontario Sheep Farmers
OVC	- Ontario Veterinary College
OVMA	- Ontario Veterinary Medical Association
RED	- Rural Economic Development Program
ROMA	- Rural Ontario Municipal Association
RVT	- Registered Veterinary Technician
SRVO	- Small Ruminant Veterinarians of Ontario
VAP	- Veterinary Assistance Program
VCRP	- Veterinary-client-patient relationship
VFO	- Veal Farmers of Ontario
VSC	- Veterinary Service Committees
VSTEP	- Veterinary Skills Training and Enhancing Program

Table of Contents

Executive Summary	1
Introduction	2
Methods	3
Jurisdictional Scan	3
Mapping	4
Stakeholder Interviews	5
Focus Groups	6
Results	7
Mapping	7
Veterinarians	7
Farms and Farm Animals	8
Challenges and Opportunities	12
The Challenge	12
Impacts on Producers	14
The Cause	15
Recommended Solutions & Roles	18
Government	20
Producers and Producer Organizations	27
Northern Producer Animal Health Network	28
Veterinarians and Veterinary Organizations	32
College of Veterinarians of Ontario	34
Academia	35
Conclusions	38
References	39

Executive Summary

Agriculture across Ontario is incredibly diverse, with high concentrations in southern Ontario, eastern Ontario and to some extent, northern Ontario. Livestock farms need reliable access to veterinary services in order to ensure optimal health and welfare of their animals; however, certain regions of Ontario have few veterinary clinics, which makes it difficult for operations in these areas to receive routine or emergency services in a timely manner. Barriers to accessible care not only impact animal welfare, but also the experiences of those who care for the animals and veterinarians alike.

This study sought to understand the current and future barriers to improving veterinary capacity in underserved areas within the province, focusing on northern Ontario.

As part of this research, we sought to:

- Determine the real and perceived social/economic barriers to veterinary practices;
- Assess current and future needs for veterinary services in the north
- Review current policies, programs, and practices in order to develop recommendations

The research focused on the roles of government, academia, veterinarians (and veterinary organizations) and northern municipalities to address access barriers. Below, a summary of key recommendations by stakeholder is provided:

Government

- Reviewing northern-specific funding programs for veterinarians
- Increase funding for externships in northern Ontario

Academia

- Review student recruitment strategies, focusing on northern students
- Assess effectiveness of current large animal programming

Veterinarians and Veterinary Organizations

- CVO should continue work on this issue with their task force
- Explore opportunities to increase use of registered veterinary technicians

Northern Municipalities

- Explore attraction and retention strategies for new veterinarians
- Improve attraction and retention strategies of new immigrants

Introduction

Agriculture across Ontario is incredibly diverse, with high concentrations of agricultural activities and commercial livestock in southern Ontario, eastern Ontario and to some extent, northern Ontario. Importantly, commercial livestock farms across Ontario need reliable access to veterinary services in order to ensure optimal health and welfare of their animals (Prince et al., 2006). Key veterinary services include advice on disease prevention, control, and best production practices, access to antimicrobials and other medications, and emergency services. In addition to the benefits for livestock health, veterinary services also contribute more broadly to improved human and public health by addressing concerns related to zoonoses, food safety, and biosecurity (Prince et al., 2006; Lem et al., 2019); however, despite the importance of veterinary services for livestock and broader society, certain regions of Ontario (often rural and remote areas, such as northern Ontario) have few veterinary clinics, which make it difficult for operations in these areas to receive routine or emergency veterinary services in a timely manner.



Initiated in Fall 2020 with funding from the Special Initiatives call through the Ontario Agri-food Innovation Alliance Research Program (addresses research priorities set by the Ministry of Agriculture, Food, and Rural Affairs [OMAFRA], Drs. Sara Epp, David Kelton, and Steven Roche, along with a diverse team of industry stakeholders commenced a project aimed at examining the needs, capacity, and barriers to accessing food animal veterinary services in underserved areas of rural Ontario. The purpose of this project is to support the livestock and veterinary sectors by investigating the social and economic barriers to improving veterinary capacity in rural areas of Ontario, review current programs and identify gaps, and assess the current and future needs for veterinarians in rural Ontario. This report outlines some of the key lessons learned from the project.

Methods

The project involved several phases:

- 1 **Jurisdictional scan:** A review of the current scope of evidence for implementing academic, government, and veterinary strategies for overcoming current barriers.
- 2 **Mapping and identifying underserved areas:** Mapping locations and service areas of rural veterinarians and farms, using ArcGIS software, to identify gaps in service areas.
- 3 **Stakeholder interviews and surveys:** Conduct over 30 interviews with key stakeholders to understand past programs as well as current needs.
- 4 **Focus groups:** Conduct focus groups with current veterinary students from the Ontario Veterinary College to understand what factors might attract them to large animal practice and northern Ontario.

While the results of this project are broadly applicable to many rural and remote areas of Ontario, the major focus of this report has been on northern Ontario. Each phase of this project is described in further detail below.

1. Jurisdictional scan

The issue of veterinary capacity in rural and northern Ontario is multifaceted. Therefore, solutions will require a variety of programs and strategies facilitated by various stakeholders, including government organizations, academia, producers, and veterinarians. A jurisdictional scan was conducted to explore a wide array of policies and programs that have been effective in attracting and retaining veterinarians in rural communities globally, in order to make recommendations for building veterinary capacity in rural Ontario.



More specifically, the objectives of the jurisdictional scan were to:

1. Assess the need for veterinary services within underserved areas in Ontario;
2. Explore current policy surrounding livestock farming in northern Ontario;
3. Collect information on existing programs and strategies within Canada, North America, and internationally that aid in providing veterinary care for the food animal sector in rural and remote regions;
4. Outline and evaluate the success of current veterinary assistance programs and strategies within Canada; and
5. Present information on existing programs and strategies to create recommendations and strategies that may be effective in improving the future functioning of rural Ontario farming

Key findings of the jurisdictional scan with particular relevance to the Ontario context are presented throughout the report.

For additional information and findings from other North American and international contexts, the full jurisdictional scan report has been provided as a supplementing document to this report.

2. Mapping

In order to identify underserved areas across the province, we sought to map the location of food animal veterinarians and livestock and poultry farms. It was anticipated that underserved areas would be located predominantly in northern Ontario, in addition to some areas of eastern Ontario. We worked with OMAFRA, veterinary associations, livestock and poultry associations for data and reviewed the Canadian Census of Agriculture. Information for farms based on Farm Business Registration Numbers was obtained from OMAFRA via connection.ca; organizations are able to access information in this portal via usage agreements in their region. In northern Ontario, these agreements are with the Northern Policy Institute.

We then used ArcGIS software to map the current geographic location of these facilities in the regions of interest to characterize the number and type of farms by region and the proximity of veterinary services.

3. Stakeholder Interviews

A series of semi-structured stakeholder interviews were planned to fully understand the context of this issue. Interviews were conducted by phone or video call with representatives from primary livestock production, veterinary services, and the public sector. Each interview involved one interviewer accompanied by a note-taker to assist with synthesis and writing.

A total of 42 interviews were conducted. More specifically, we conducted interviews with primary livestock producers (n = 9); commodity group organizations (n = 8; Beef Farmers of Ontario (BFO), Dairy Farmers of Ontario (DFO), Veal Farmers of Ontario (VFO), Chicken Farmers of Ontario (CFO), Ontario Pork (OP), Ontario Sheep Farmers (OSF), Egg Farmers of Ontario (EFO), Feather Board Command

Centre (FBCC)); government staff (n = 8; OMAFRA (notably the Agriculture Development and Animal Health and Welfare Branches), Ministry of Energy, Northern Development, and Mines (MENDM), and representatives from the Rural Ontario Municipal Association (ROMA); veterinary associations (n = 6; OVMA, College of Veterinarians of Ontario (CVO), Ontario Veterinary College (OVC), Ontario Association of Veterinary Technicians (OAVT), Designated Area Veterinarians Association, Ontario Association of Bovine Practitioners (OABP), Small Ruminant Veterinarians of Ontario (SRVO); practising veterinarians (n = 6); non-profit farmer organizations (n = 4; Northern Ontario Farm Innovation Alliance (NOFIA), Ontario Federation of Agriculture (OFA), Northern Producers Animal Health Network (NPAHN); Ontario Soil and Crop Improvement Association (OSCIA)); and academia (n = 1; OVC). While interview discussions were tailored to each interviewee, interviews for each stakeholder group followed a pre-established interview guide.

Generally, interviews focused on (1) understanding the historical context (what programs have been in place, how have they impacted the situation, and how other regulations/policies/programs/ practices are affecting capacity); (2) characterizing the current situation (number and type of farms, geographic location and proximity to veterinary services, current programs, policies, and tools in place to support veterinary capacity, and perceived challenges and barriers inhibiting veterinary service growth and staff retention); and (3) estimated future needs for veterinary services and potential strategies or solutions that may help to address the issue. These interviews were semi-structured to permit additional input from participants where appropriate.

4. Focus Groups

Focus groups were conducted virtually with current veterinary students at the OVC, University of Guelph. Four focus groups were held with a total of 43 students, representing each year of study and a diversity of specializations.

Each focus group lasted 60 minutes and generally focused on (1) reasons for the students intended specialization and preferred geographic location, (2) in what ways the veterinary program influenced their decision, (3) recommended changes to the veterinary program to support students interested in large animal or mixed practice, (4) opportunities to better support students interested in working in northern Ontario, and (5) the impacts of financial incentives on students' decisions to pursue large animal practice and establish a clinic in northern Ontario.



Results

The results for this report are described in two major sections. The first section focuses on the progress and impediments to mapping the location and service areas of veterinary clinics in Ontario, and the location and number of livestock and poultry farms and animals across Ontario. The second section combines the results of the jurisdictional scan, stakeholder interviews, and focus groups to describe the challenges, current system of supports, and opportunities to address this issue across Ontario.

Mapping

Veterinarians

Using data from CVO, the location of veterinary clinics designated as mixed or large animal practice and any corresponding food animal mobiles were mapped using ArcGIS software. Fields of interest at the veterinary level included: practice name, clinic director, latitude and longitude, address, primary telephone, mobile clinic (y/n), practice type (mixed, large), and species serviced.

CVO also provided information on the number of veterinarians in Manitoba and Quebec that are licensed to practice in Ontario.

We also contacted OVMA, OMAFRA, Ontario Health Network, and OVC to inquire if they had information that would be helpful in the mapping process; however, data, if available, was limited in application or unsuitable for the needs of this study. We also received a list of names of veterinarians/veterinary clinics who indicated they would be willing to service small (non-commercial/backyard) poultry flocks, and a list of veterinarian members for the following species-specific groups: OABP, OAPV, OASV, SRVO.

The OAVT provided a spreadsheet of home mailing addresses for all Registered Veterinary Technician (RVT) members, and a second spreadsheet of RVT members who participated in a wage survey (subset of all members by region).

However, this information was not deemed to be useable as it did not point directly to the location of a given veterinary clinic and/or it was not representative of the entire population of RVTs.

Farms and Farm Animals

Through a series of discussions with OMAFRA, it was determined that premise ID could not be used to map farms, as the majority of farms in Ontario, aside from dairy farms, are not registered. As only sporadic information was available through premise ID, a series of in-depth discussions with each livestock and poultry commodity group in Ontario was conducted to understand the data they had available on the location and size of farms across Ontario. All producer associations provided details on the number of farms and animals by county across the province. In most cases, this information represented counts obtained between 2019 and 2021; however, some commodity groups (e.g. BFO) were only able to provide information from the most recent census, which reported on information from 2016.



Due to privacy reasons, more specific data were not able to be shared, or the specific data were not collected by the producer group. Unfortunately, mapping information at the county level did not provide a sufficient level or quality of data to help inform this project. Further, inconsistency in the accuracy and reliability of the data made mapping the farm level layers very challenging. More focused efforts to work with government and industry to get a more granular picture of where farms are located is needed.

Fortunately, a more recent engagement with OMAFRA in early 2021 yielded some success through connection.ca. Location information on large animal farms based on Farm Business Registration Numbers, and the estimated number of food animal veterinarians/clinics in each region (based on OMAFRA estimates) are presented in **Table 1**.

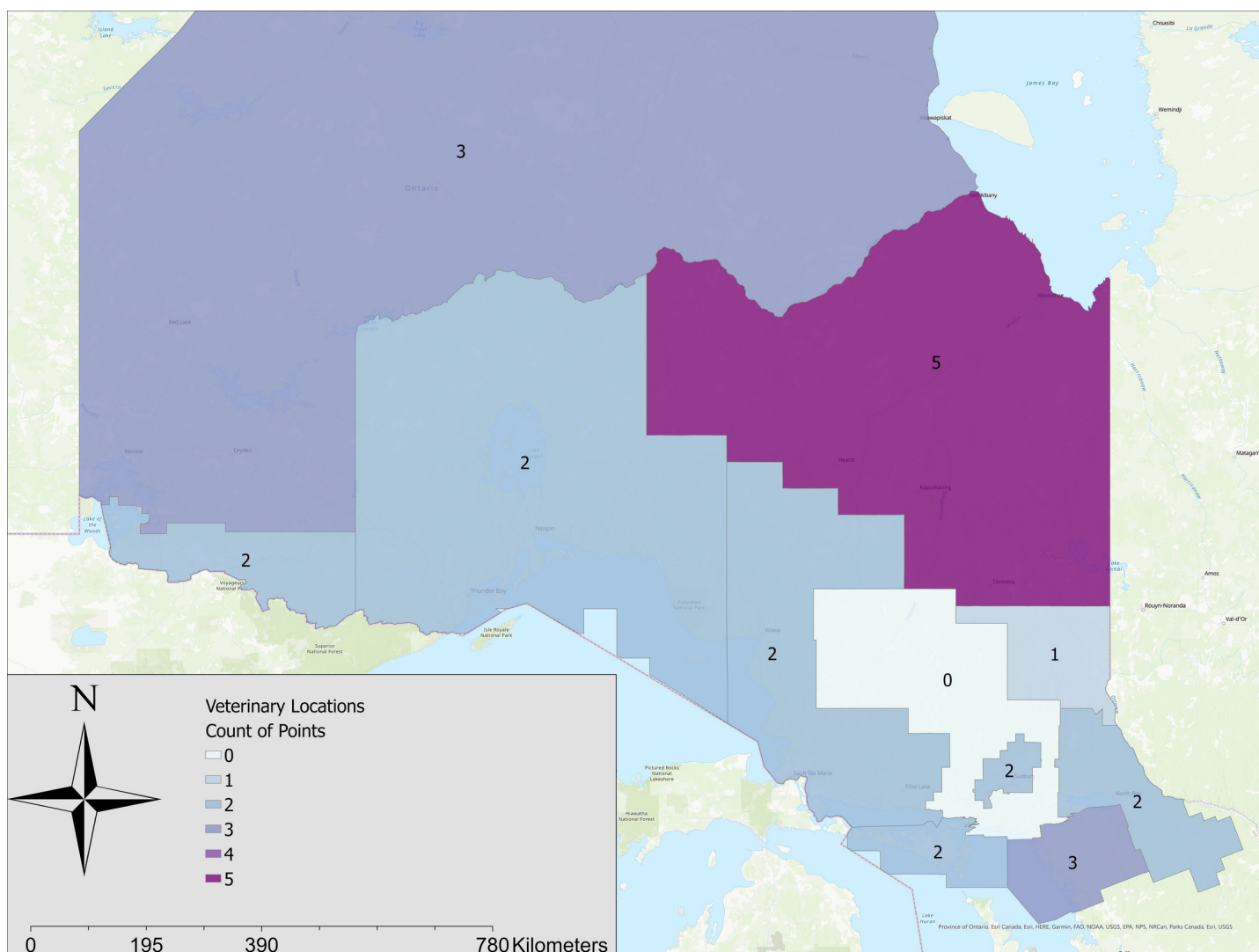
Table 1. Estimated number of large animal farms and veterinary services by region. Farms were identified via Farm Business Registration Numbers. Information provided by OMAFRA.

Region	Available Services	Total	Beef	Dairy	Goats	Horses	Sheep	Other
Algoma	<ul style="list-style-type: none"> · 1 food animal veterinarian · 1 food animal veterinary clinic 	129	99	9	1	5	5	10
Cochrane North	<ul style="list-style-type: none"> · 1 food animal veterinarian that covers 2 clinics · No Dairy repo work 	30	21	3	2	2	1	1
Cochrane South	<ul style="list-style-type: none"> · No food animal veterinarian/clinic · Relies on Temiskaming Veterinary Services 	36	28	2	2	0	2	2
Dryden	<ul style="list-style-type: none"> · 1 food animal veterinary clinic/veterinarian (Dryden and Kenora) 	27	17	0	0	2	2	6
Greater Sudbury	<ul style="list-style-type: none"> · No food animal veterinarian/clinic 	44	20	0	0	13	1	10
Kenora	<ul style="list-style-type: none"> · 1 food animal veterinary clinic/veterinarian (Dryden and Kenora) 	7	1	0	0	0	4	2
Manitoulin	<ul style="list-style-type: none"> · 1 food animal veterinary clinic 	135	115	6	3	3	3	5
Nipissing	<ul style="list-style-type: none"> · 2 food animal veterinarians · 1 food animal veterinary clinic 	104	58	11	4	4	13	14

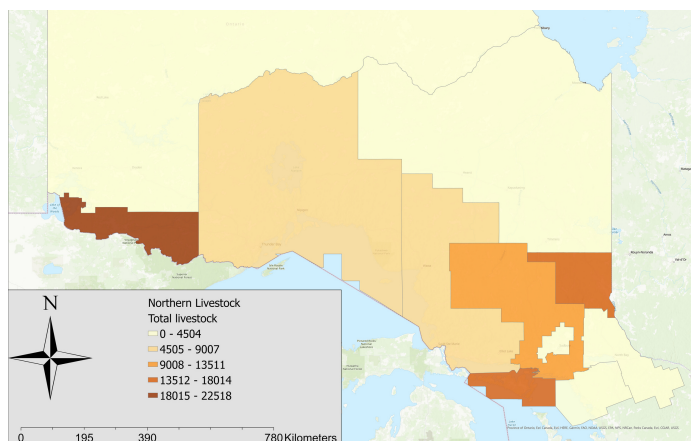
Region	Available Services	Total	Beef	Dairy	Goats	Horses	Sheep	Other
Rainy River	· 2 food animal veterinary clinics	151	140	6	0	0	0	5
Sudbury East	· 2 food animal veterinarians · 1 food animal veterinary clinic	45	28	6	0	5	1	5
Sudbury West	· Number of veterinarians and clinics unknown	25	22	3	0	0	0	0
Thunder Bay	· 1 food animal veterinary clinic	96	47	28	1	4	4	12
Timmins	· No food animal veterinarian/clinic · Relies on Temiskaming Vet Services	17	8	1	2	2	0	4
Temiskaming	· 4 food animal veterinarians · 1 food animal veterinary clinic	179	111	41	3	3	15	6
Parry Sound	· 2 food animal veterinarians · 2 food animal veterinary clinics	97	66	4	2	7	8	10
		Total	Beef	Dairy	Goats	Horses	Sheep	Other
TOTAL		1,122	781	120	20	50	59	92

Utilizing the data regarding veterinary clinics and producers shared with the research team, some mapping data was produced as part of this study. Given the limitations detailed above, the maps are limited in scope and are included on the following page for information purposes only. Detailed mapping has been completed by the Golden Horseshoe

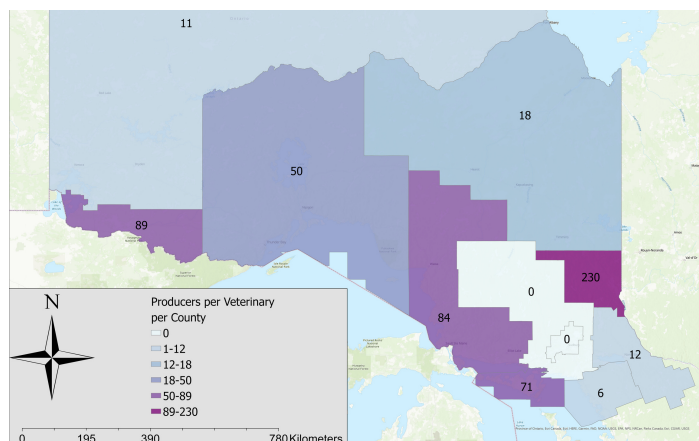
Food and Farming Alliance in partnership with the Northern Policy Institute with funding from the Greenbelt Foundation through the ConnectON mapping portal (www.connecton.ca). While not publicly available, appropriate agencies can request access to this data and sign formal sharing agreements.



Map 1: Number of veterinary clinics in each northern district



Map 2: Total livestock per northern district



Map 3: Producers per veterinary clinic by district

Challenges and Opportunities

Select results from the jurisdictional scan have been combined with results from the stakeholder interviews and focus groups to describe some of the key challenges related to veterinary access in rural areas of Ontario, the current system of supports, and opportunities to address the situation.

The Challenge

In 2013, the OVMA conducted a census of bovine veterinary practices to determine veterinary coverage of beef and dairy farms. Many of the northern and central/eastern census divisions were predicted to have gaps in veterinary service by 2020, while other regions were expected to be oversaturated with veterinarians seeking to serve a consolidating client base (OVMA, 2013). This, along with other reports suggest that while demand for food animal veterinary services is predicted to increase in some areas, there is a serious labour shortage in certain rural and remote regions

(Remsburg et al., 2007; OVMA, 2013; Prince et al., 2016; AGRI-LMI, 2016).

Northern Ontario is often cited as one of the major areas where veterinary capacity issues are most prevalent and is divided into twelve districts: Algoma, Cochrane, Greater Sudbury, Kenora, Manitoulin, Nipissing, Rainy River, Sudbury, Thunder Bay, Timiskaming, Parry Sound, and Muskoka (Champagain, 2017). Combined, these regions represent over 80% of the province's land area, but only account for approximately 6% of the provincial population (Chapagain, 2017; Statistics Canada, 2018).



According to the Census of Agriculture, in 2016 there were 1,985 farms across all of northern Ontario, representing 4% of Ontario farms (Statistics Canada, 2018).

The Government of Ontario has expressed an interest in expanding the province's agri-food sector into northern areas as an opportunity to increase the production of local foods (OMAFRA, 2016). In partnership with BFO - an organization dedicated to representing over 19,000 of Ontario's beef farmers - the province of Ontario developed the Northern Livestock Pilot and Beef North program to promote the expansion of Ontario's beef industry (Beef North, 2021; OMAFRA, 2016). This action plan, in collaboration with BFO, promotes sustainable expansion by providing economic assistance for producers looking to expand or start their businesses in northern Ontario (Beef North, 2021; OMAFRA, 2016); however, a push for northern expansion within the beef industry comes with an increased need for essential services by livestock producers, including veterinary care (Government of Ontario, 2021).

A lack of veterinarians in rural Ontario, combined with a greater distance between farms, has created gaps in veterinary coverage in the north, causing underserved areas or regions with limited to no veterinary services available for livestock producers. It is also important to note that beef is not the only sector represented in northern Ontario; many other producer groups are present in these regions and face similar challenges in accessing veterinary care.

Regional Variation and Veterinary Access

The challenges related to veterinary access often appear to be region-specific. Each region has slightly different characteristics in terms of farm density, farm type, need for veterinary services, and proximity to an established veterinarian. For this reason, blanket policies and programs that do not consider some of the regional contexts are likely to be ineffective in the long-run.

Through personal communications with Gord Mitchell, the Executive Secretary of NPAHN, the following areas have been highlighted as having little to no veterinary coverage:

1. **Sudbury West:** No permanent veterinarian is available in Sudbury West, and there is reliance on Manitoulin Island Veterinary Services for veterinary care.
2. **Cochrane South:** There is no local veterinarian in the Matheson area. Temiskaming Veterinary Service does limited calls, but no emergency service is provided.
3. **Timmins:** No full-time large animal veterinarian is available.
4. **North Parry Sound & East Nipissing:** There is a local veterinarian that focuses on small animals. Powassan and Bodfield areas use Sturgeon Falls Veterinarian, which is 70 km away.

Mr. Mitchell also suggested that while there are currently some areas within northern Ontario that have adequate veterinary coverage, the veterinarians in these areas will likely be retiring soon

without younger veterinarians to take over their practices. Locations with aging veterinarians include Hearst, Kapuskasing, Cochrane North, Dryden, Bruce Peninsula, Algoma, Temiskaming, and Renfrew County.

Impacts on Producers

Producers commonly expressed frustration over not being able to get access to a veterinarian in a timely manner to deal with emergencies. The issue of timely access to a veterinarian was also commonly expressed as more important in recent years because of the need to establish and maintain a veterinarian-client-patient relationship (VCPR) to get access to antimicrobials. Producers commonly relayed frustrations over not being able to access veterinary services when needed; conflicts and disagreements with their veterinarian; a desire to seek other veterinary support but not having another option; and costs. Barriers to accessible care not only impact animal welfare, but also the experiences of veterinarians and those who care for animals (Lem, 2019).



Lack of veterinary access leads to inequities, which have been highlighted as an important social determinant of human and animal health (Schelling et al., 2005; Baker et al., 2018; Card et al., 2018). These inequities may come in the form of less frequent advice and education, delayed or insufficient care to animals, and/or access to necessary medications. This is important, as routine access to veterinarians has been associated with improved health and welfare outcomes, such as the use of pain management medications in dairy cattle (Winder et al., 2018).

Furthermore, as of December 1, 2018, regulations imposed by Health Canada placed restrictions on medically important antimicrobials, which require livestock producers to establish and maintain a valid VCPR and receive a prescription for antimicrobial use on the farm (Health Canada, 2017). Therefore, a lack of veterinary access presents important limitations and could result in negative health and welfare outcomes in underserved regions.

The Cause

The underlying reasons for regional gaps in veterinary service are complex, and relate to a number of socioeconomic and client factors (number and type of farms, trends for increase or decrease) and veterinary business (operational costs, revenue models, staff retention) (Gwinner et al., 2006; Andrus et al., 2006a, b; Truchet et al., 2018; Boissonneault and Epp, 2018; Lem, 2019). There are also considerable logistical, operational, and financial challenges in serving large geographical areas with smaller populations, as well as challenges in attracting veterinarians to rural and remote areas (Lem, 2019).

Many of these issues were discussed during interviews with veterinarians and veterinary associations. Interviewees commonly described the challenge of being able to build and sustain a business that is solely focused on large animal medicine, and most suggested that companion animal medicine was essential to maintaining an economically viable business. They suggested that since the early 2000's there has been a trend in moving away from multi-species specialities, and a focus on companion animal specialities, which has led to better and more predictable revenues. Further, they suggested that many regions have too few farms, and/or those farms' needs are too infrequent to support a profitable business. The frequency and type of services desired by farms in rural regions also presents a challenge. Veterinarians commonly highlighted that they cannot plan and rely on emergency work to be the foundation of their large animal business, and often noted that this type of work can be less desirable to perform compared to other consultative or routine work. Simply put, veterinary businesses must have a foundation of routine and reliable clients to be profitable.

The uncertainties and potential for unreliable service needs, in addition to the costs of driving to and servicing these clients, makes it a difficult model to build a sustainable business.

Local infrastructure (schools, hospitals, public services and amenities), personal factors (school debt, wage/salaries, career expectations) and social factors (lifestyle preferences, family opportunities and supports) have also been identified as key barriers (Gwinner et al., 2006; Andrus et al., 2006a, b; Truchet et al., 2018; Boissonneault and Epp, 2018; Lem, 2019). Interviewees commonly pointed to the changing dynamics of what veterinarians desire in terms of a career, noting new graduates desire more work-life balance, with fewer days and weekends on call, an opportunity for mentorship and collegial activities, and the opportunity to use a broader set of skills and knowledge than that traditionally associated with "fire-engine" medicine; all opportunities that a larger, multi-veterinarian practice can offer. Most interviewees that had experience in recruitment, hiring, and retention of new veterinarians and veterinary staff

highlighted that one of the biggest challenges to retention is the extent to which the new hire and their family can access the social supports they need to build the life they desire.

During focus group discussions with current veterinary students, the social and economic barriers were listed as significant factors in deciding the type and location of practice. While few students that participated were from northern Ontario, those that were indicated a keen interest in returning to their home community to work. Generally, students shared concerns regarding isolation, distance to family, and work-life balance as significant social barriers. Economically, students stressed the long travel distances and lower rate of pay when compared to small animal practice as being the most significant barriers. Students also discussed a general hesitance to work with large animals, noting limited exposure through their courses, which resulted in a lack of confidence when handling an animal. Students also noted the difficulty in working with farmers and a general sense that if you did not grow up on a farm that you would not be taken seriously by the

client. Combined, these challenges appear to dissuade students from pursuing either large animal practice or practicing in northern Ontario.

Demographics and culture have also been identified as barriers to veterinary care. Differences between animal owners and veterinarians with respect to the cultural roles of animals, expectations of care, and individual experiences contribute to challenges in accessing veterinary care (Boissonneault and Epp, 2018; Wasson and Wieman, 2018). For example, self-sufficiency, stoicism, and trust are cultural issues that have been identified as barriers to accessing care among rural Canadian farmers (Wasson and Wieman, 2018). Certain interviewees spoke to these issues, highlighting that while many dairy clients see the veterinarian as an important resource and member of the team, some beef, equine, and small ruminant clients viewed the veterinarian simply as a cost that should be avoided if possible. While these attitudes most certainly are influenced by the economics of different industries, interviewees felt the characteristics of the clients in these areas also influences the likelihood that veterinarians can establish a solid base of

reliable work to support their business.

Collectively, these social and economic barriers appear to be driving regional gaps in veterinary service and challenge the sustainability and growth of veterinary practices in rural and remote areas of Ontario.

Recommended Solutions & Roles

The issue of serving rural and remote populations is not unique to Ontario. Other jurisdictions in Canada and abroad face similar challenges, and several studies have explored potential strategies to improve food animal veterinary capacity in remote and underserved regions (Leyland and Catley, 2002; Cummings, 2006; Gwinner et al., 2006; Prince et al., 2006; Windsor, 2009; Lowe, 2007; Remsburg et al., 2007; Sarita et al., 2015; Eccles, 2018; Boissonneault and Epp, 2018). A task force in the United States has also conducted work to better understand challenges and strategies for recruiting and retaining food animal veterinarians (Council for Agricultural Science and Technology, 2020).

Factors influencing recruitment and retention were complex, including impacts of urbanization and agricultural land use, veterinary school costs, acceptability of rural living, curriculum and faculty shifts toward companion animals, food demand, and food animal veterinarian wages. To address these complex factors, the task force highlighted the need for multifaceted response strategies.

The resounding conclusion from our work, and others, is that multiple strategies must be employed at government, industry, and academic levels in order to be effective (Prince et al. 2006; Council for Agricultural Science and Technology, 2020).





The issue of serving rural and remote populations is also not unique to veterinary medicine (Lem, 2019). A 2017 review of strategies to attract nurses and doctors reported that there are five main types of interventions employed for improved rural retention, including educational, financial, regulatory, personal, and professional interventions (WHO, 2010; Behera et al., 2017). For example, studies suggested changing student selection criteria, improving educational opportunities for workers, introducing financial incentives, creating more supportive working environments, and making it compulsory for health professionals to work in underserved areas (Blaauw, et al., 2010). The World Health Organization has published numerous reviews and reports summarizing evidence of best practice (WHO, 2010). These reviews highlight strong evidence of the benefit of:

admission and curricular changes to prioritize an interest in, and understanding of, rural health in graduates; subsidizing relocation and living costs to improve living conditions of rural workers; supporting workplaces to maintain a safe and well-equipped working environment; establishing peer networks and developing career development programs for rural workers, and; adopting public recognition measures, awards, and titles to intrinsically motivate rural workers (WHO, 2010). Additional details regarding medical attraction and retention programs in Canada are available in **Table 2** of the supplementary jurisdictional review.

The following section reviews some of the key existing supports and opportunities for new or modified supports, broken down by the different organizations that have a role to play in the issue of veterinary capacity in Ontario. A comprehensive list of past and current veterinary capacity programs and strategies in other Canadian, North American, and international contexts is available in **Table 1** of the jurisdictional review.

Government

Recognizing the need to support veterinary services in rural areas, the Canadian and Ontario governments have implemented several funding programs. Previous research has suggested that governments should increase the frequency and funding of these types of programs (Boissonneault and Epp, 2018).

Veterinary Assistance Program

Administered by MENDM, the Veterinary Assistance Program (VAP) is a financial assistance program that helps rural veterinarians with the cost of travel reimbursement, continuing education costs, and locum assistance. VAP is delivered through a partnership with NPAHN and DAVA. Briefly, veterinarians are reimbursed \$1.20 per kilometre travelled, within 70 kilometres of the practice location, up to a total of \$40,000 a year. Any travel that is beyond the 70-kilometre maximum, up to 250 kilometres, will have a 10-kilometre deduction taken from the reimbursement.

Veterinary Service Committees (VSCs) are responsible for representing large animal owners within their geographic region, suggesting program improvements, recruiting veterinary practices to their region, issuing annual contracts to veterinarians, identifying suitable replacements when necessary, and educating local producers about the program. A total of 22 VSCs exist in regions across northern Ontario, including: Algoma, Bruce Peninsula, Cochrane South, Cochrane/Glaxo, Dryden, East Parry Sound, Haliburton, Hearst, Kapuskasing, Manitoulin, Muskoka, North Hastings, North Parry Sound/East Nipissing, Rainy River, Renfrew, Temiskaming, Timmins, Thunder Bay, West Nipissing/East Sudbury, West Sudbury, West Parry Sound) (NPAHN, 2020). DAVA (the veterinarian side of VAP) administers an additional \$800-\$1,000 for students who complete externships in northern Ontario.

Interviews with MENDM noted that the total amount of funds allocated to the program (~\$800,000 annually) are rarely spent each year.

This is a reflection of a more rigid structure in how the funds are allocated and disbursed, rather than a lack of need or desire to issue financial support. It is clear from interviews with veterinarians that the VAP program is essential, with many veterinarians suggesting that they would not be able to offer large animal veterinary services if it did not exist. In fact, many veterinarians felt strongly that the program needs to be modernized in how funds are distributed and that the total amount of funding available should be increased. The DAVA support for students is also viewed as a critical recruitment tool for veterinary clinics.

Opportunity for upcoming VAP Review

The MENDM indicated that the VAP program is due for review in 2022. Groups such as DAVA and NPAHN will be integral to this review process. Importantly, other organizations with a vested interest in this issue would benefit from being involved. The CVO are leading a multi-stakeholder group of veterinary (OVMA, OVC, OAVT, private practitioners), government (OMAFRA), and producer stakeholders (primarily

BFO) in an initiative aimed at addressing veterinary capacity and access issues for beef farmers in rural Ontario. This group has identified a willingness to actively participate in the current review of the VAP and advocate for a renewed program that reflects current costs to maintain and expand business sustainability incentives for veterinary medicine that promote full spectrum production management services. Involving this group as part of the review process should be considered an important step in ensuring all opportunities to modernize and improve the VAP are evaluated.

Some specific suggestions have been put forward for the VAP. Veterinarians have suggested that the VAP increase the amount of funds designated to a single contract to \$60,000; this would mean an increase in the overall program budget to closer to \$2 million in order to accommodate 32 contracts. It was also suggested that the mileage rate that is offered needs to change. The rate was initially based on roughly 50% of the posted OVMA rate at the time.

The current OVMA rates suggest \$4.10/km for bovine calls, which would suggest that the VAP rate increase from \$1.20/km to \$2.05/km. Finally, in an effort to ensure all funds allocated to the program are spent each year, it has been suggested that participating practices would be encouraged to submit all of their mileage claims. In the event that some contracts are unspent at the end of the fiscal year, those funds could be pooled and used to support the practices that had maximized their capacity and incurred additional unsubsidized expenses.

Other Programs and Ideas

Researchers exploring this issue in other jurisdictions have also highlighted that governments and allied organizations should seek to create region-specific student debt reduction, low-interest loans, and grant/scholarship programs that incentivize graduates to seek out underserved practice areas (Prince et al., 2006; Gwinner et al., 2006).

Discussions with the MENDM also indicate that there are other provincial and federal grants and funds that could



support veterinarians when it comes to recruitment and retention of staff; however, it is clear that there is no single resource that helps guide veterinarians to the sources of support that are available. Further, many large animal veterinarians are not willing or able to commit the time needed to research, review, and apply for these programs. Making it easier for veterinary businesses to identify and access funds may help support clinic retention and growth. Importantly, this action (specifically to “actively source and collate the spectrum of existing resources that veterinary practices of all sizes can leverage”) has also been identified by the CVO-led group as a need under their objective to maintain and expand business sustainability incentives for veterinary medicine that promote full spectrum production management services.

A selection of government-supported programs and/or suggestions with potential relevance for veterinarian capacity in Ontario are provided below:

Federal Rural and Northern Immigration Pilot

The Federal Rural and Northern Immigration Pilot (RNIP, 2020) is a community-driven program offering a path to permanent residence for immigrants willing to move to selected rural communities (Government of Canada, 2020). Participating communities in Ontario include North Bay, Sudbury, Timmins, Sault Ste. Marie, and Thunder Bay. While not broadly available to all communities, this program may offer an opportunity to attract new veterinarians in rural areas.

Northern Ontario Internship Program

The Northern Ontario Internship Program (NOHFC, 2020) also offers opportunities for small rural businesses (i.e. veterinary clinics) to offset the costs associated with attracting and retaining new staff. The program includes a wage subsidy that will pay 50% of an intern's salary up to

\$35,000/year (NOHFC, 2021b). Some interviewees suggested that this program should expand its eligibility from 1 to 2 years and that the maximum funds per employee increase to \$50,000. The CVO-led group has also set an objective to lobby for a review of this program, inclusive of an increase in the funding and the length of the term.

FedNor

The Federal Economic Development Agency for Northern Ontario (FedNor) is the Government of Canada's economic development organization for northern Ontario. This program offers financial assistance for private and non-profit businesses. Some interviewees suggested this program could make funds available for veterinarians to renovate their clinics to create haul-in facilities. By investing in a facility and equipment on site, veterinarians could have clients trailer their animals in need of treatment to the veterinarian for more appropriate care. While many producers suggested this would not be their preference, this model has been heralded as being successful in Western Canada, and would provide an option to farmers who otherwise may

have to euthanize an animal if it cannot be treated in a timely fashion.

Support from the Ministry of Agriculture

It was suggested by numerous interviewees, including staff from the MENDM, that OMAFRA be more involved in this issue. Some suggested that OMAFRA could work with the OVC to provide funding (grants, bursaries) for second year veterinary students that are interested in working in rural veterinary practice, and/or enhance funding to final year externship students in rural practice. Numerous interviewees brought up the opportunity for debt forgiveness programs for new graduates entering careers in rural Ontario; one interviewee suggested \$10,000 per year for up to 4 years). OVC students indicated that grants or debt forgiveness would influence recent graduates to consider a move to northern Ontario.

OMAFRA was also identified as a potential solution for enabling the creation of haul-in facilities. One interviewee suggested OMAFRA could assist with leasing existing underutilized

facilities to veterinarians for livestock haul-in clinics. They further suggested that OMAFRA could strategically partner with other groups to also make these into educational centres for training producers and Registered Veterinary Technicians. Other discussions with interviewees suggested that OMAFRA establish a mileage support program for qualified producers. For example, if a veterinarian was not servicing a particular area, money from this program would help offset the cost to the producer for having to trailer the animal to a haul-in facility.



Some interviewees suggested that OMAFRA look at the New Brunswick model for government-funded veterinary services, noting that perhaps the Ministry could employ a small number of veterinarians who can routinely visit underserved areas to perform services as needed. In New Brunswick, veterinarians are hired and paid through the Provincial Veterinary Field Services Program (Government of New Brunswick, 2021). Government-funded large animal veterinarians are located in six rural regions across the province to provide veterinary care to rural livestock. Producers are able to schedule veterinary services through the Ministry of Agriculture, Aquaculture, and Fisheries website and see a complete list of fees for each type of veterinary service offered (Government of New Brunswick, 2021). Veterinarians who are employed by the government benefit from stable clientele and shorter working hours as a result of hours distributed across many government-funded veterinarians (Government of New Brunswick, 2021). Similarly, state employed veterinarians in Norway, Sweden, and Finland act to provide veterinary services to rural and

remote regions of these European countries (Federation of Veterinarians of Europe, 2020). Veterinary services are governed and financed by the municipal or regional government in which they are located. Municipalities are responsible for hiring and paying large animal veterinarians, ensuring that veterinarians are paid appropriately (Federation of Veterinarians of Europe, 2020).

Of note, OMAFRA announced a new cost-share program beginning in February 2022 that is intended to improve virtual care, expand telemedicine care, and address challenges related to mobile veterinary clinics and accessing care in rural and northern Ontario (OMAFRA, 2021). This program, which will invest up to four million dollars via the Canadian Agricultural Partnership, would support those in identified underserved areas with up to 50% of cost-share for equipment under eligible projects. While the timeline for submission is only open for six weeks, and numerous interviewees have expressed issues with finding the time and/or having the capacity to

apply for such funds, this investment represents a step towards facilitating improvements in veterinary access in Ontario.



Opportunities within the Rural Economic Development Program

The Rural Economic Development Program (RED) was identified as a potential avenue to support veterinary capacity in rural and northern Ontario.

The RED Program is a competitive, application-based funding scheme designed to support projects that benefit rural Ontario. Eligible projects would focus on (1) attraction and retention of workers, immigrants, and youth; or (2) redevelopment of underutilized or vacant buildings. For successful applications, the Government of Ontario will cost-share up to 70% of costs to a maximum of \$150,000 per approved project (worker attraction applications), or 50% of costs up to a maximum of \$250,000 (building redevelopment applications). Preference will be given to projects that can be completed before December 31, 2023.

Lastly, funds to support veterinarians in offering more effective training and continuing education for staff was viewed as useful for employee retention, while funds that could support veterinarians in these areas to recruit students (travel costs and accommodations to meet with and engage students, relocation fees, etc.) could also be impactful.

Producers and Producer Organizations

The previously mentioned CVO-led group initially began meeting at the request of BFO, in an attempt to address concerns their industry has raised regarding access to veterinarians. One of the key pillars of their vision for this project is to “promote beef herd health and production programs through veterinary and producer partnerships”. Under this pillar, they have identified three objectives:

1. Create multi-level incentives that promote quality assurance and producer education on progressive herd health

- Seek partners to explore and identify government and non-government incentive opportunities that optimize herd health and welfare
- Develop a white paper on the “why” arguments for the creation of new incentives
- Seek partners and funding to support a long-term incentive strategy

2. Create research interest in beef herd health and promote channels for knowledge transfer

- Promote beef at Guelph as a centre of excellence in production management and herd health practices for both producers and veterinarians
- Create a “living” conduit where producers and the veterinary team can identify relevant questions to consider within the existing research channels
- Link producers, veterinary professionals, and industry in seeking funding that supports research initiatives in production management

3. Create and promote mentorship programs that support the herd health “family”– producer, veterinary team, on-farm team, etc.

- Identify existing mentorship programs in Ontario and in other jurisdictions, and their associated strengths and weaknesses, to determine an approach or approaches that will foster herd health

- Seek partners to champion mentorship opportunities, inclusive of producers and veterinarians
- Seek funding and partners to support program development as needed

The collaborative development of these ideas between the veterinary, government, and producer sectors in Ontario demonstrates important progress and potential for addressing producer needs as it relates to veterinary services. It also presents a model for other commodities that may be looking to support their membership and more effectively involve veterinarians in their businesses.

Northern Producer Animal Health Network

Research in the human health arena highlights those conversations aimed at improving access must begin with individual regions to determine what services are needed and how to fulfil those needs.

Conferences have even been organized to engage stakeholders in this issue. For example, the annual "Rural Alberta Community Physician Recruitment and Retention Conference" supports dialogue and planning on how to develop local solutions in Alberta (NADC, 2010). Clearly, a detailed and ongoing assessment of the situation in Ontario is needed to inform programs, policies, or practices to support access to veterinary care. NPAHN is perhaps best structured to help address and understand the regional differences and potential solutions. Their regional VSC's are already positioned to help inform and understand issues locally, as well as administer funds for VAP.

However, this organization is made up of one employee and numerous volunteers, which limits the extent to which NPAHN can have real impact, oversight, and reach. Investing in additional staff to organize, lead, and support these VSC's, and to communicate with other partners and stakeholders would be valuable.

Importantly, NPAHN released an action plan for 2021-2024 that outlines a number of key activities and objectives that relate to this issue (NPAHN, 2020):

1. Conflict Management

- Develop Conflict Management Policy and Procedures: Although in the majority of VSC areas the VAP is operating without conflict, it is important to develop a conflict management policy that all parties can agree to in the event of future issues. This policy and process must have input from each of the stakeholder groups and approval from MEDNM when finalized. The VAP guidelines could be amended to include such a policy. The policy would identify the parties that should be engaged in the discussion; establish the procedures for each stakeholder; and identify the parties who would have authority to make final decisions.

- **Formalize the Conflict Management Policy:** Once the conflict management policy has been developed and approved by each stakeholder group, it should be formalized through a memorandum of understanding (MOU) with DAVA, NPAHN, and MENDM to collaboratively mediate solutions for situations where there is conflict within the VAP between stakeholders.
- **Investigate the Engagement of a Professional Mediator:** Research the logistics and fees for contracting a professional mediator to resolve issues that cannot be dealt with by local VSCs and NPAHN.



2. Awareness and Promotion

- **Initiate Improvements to NPAHN Website:** Sharing information and positive communication messages will increase visibility and demonstrate the value of VAP. Suggestions included: Link the NPAHN website to other commodity websites, eliminate the events page, develop and post ‘good news’ and success stories about VAP, northern producers, and participating veterinarians.
- **Promote VAP through Social Media Channels:** Develop a Facebook page for NPAHN. Create content and success stories to post. Use Twitter, Instagram, or other social media channels to share information about the program.
- **Develop a VAP Presentation Kit and train members to use it:** This would be available for VSC members to use in presentations to municipal council, producers, and other commodity groups.

It would include a variety of handouts, digital presentations, speaking notes, and a one-page infographic to demonstrate the value of the program and the importance to the livestock industry. It is also important to develop and deliver a training package for directors of VSCs and NPAHN to train them to effectively utilize the new VAP presentation kit.

3. Review Funding Models of VSCs and NPAHN

- Review the funding and collection of fees by VSCs to possibly standardize or streamline the process. Acknowledging that each VSC area is unique in the source and collection of funds, there may be options to increase the effectiveness of the process. This may require a revision of constitutions to align them with existing or future funding models.

4. Review constitutions of VSCs for continuity with NPAHN

- Undertake a review of each VSC's constitution to determine best practices and achieve consistency as well as compliance with NPAHN's constitution that is the legal non-profit organization. Recommend changes to VSC's constitutions as appropriate to embrace best practices and alignment with NPAHN's constitution.

5. Develop and Deliver Governance Training for Members of VSCs and NPAHN

- Develop and deliver a training program that would outline the roles and responsibilities of each of the stakeholders and clarify the VAP guidelines. Resources could include an orientation package, program fact sheet, and online manual. The resources and training should be delivered to all stakeholders of VAP including VSC and NPAHN executive members and participating veterinarians/DAVA.

6. Develop a Succession Plan for NPAHN and VSCs

- Develop a succession plan for the NPAHN leadership that would include an active recruitment and mentorship program to encourage new Directors on the board. This would involve identifying potential candidates, engaging candidates in the organization meetings, providing an information package, and mentoring the candidates prior to nomination into a leadership position.

7. Addressing Future Gaps in Veterinary Service

- There is agreement that it is difficult to attract veterinarians, and particularly large animal veterinarians, to northern Ontario. There is considerable concern about existing veterinarians retiring, with no new veterinarians moving into the area. In addition, there is concern regarding temporary absences of veterinarians. To address this, the following should be initiated:

- **Work with College of Veterinarians of Ontario:** A conversation with the College of Veterinarians of Ontario would be beneficial to understand the work they are doing that could address this concern.
- **Identify Future Gaps in Veterinary Service in VSC Areas:** The VSCs should be identifying gaps and discussing succession planning with their local VAP vet.
- **Create Contingency Plans in VSC Areas:** VSCs and participating veterinarians should create contingency plans for veterinarian services due to temporary absences such as vacation and planned and unplanned absences.

NPAHN is already a recognized structure within the VAP that has established a series of trusted networks across northern Ontario. A similar approach to the VSCs might be able to be extended to other regions of Ontario that have been

recognized as being underserved by veterinarians. Providing additional support to NPAHN and overseeing the formalization of the VSC process (including evaluation and accountability policies, ensuring that representatives have specific paid roles and responsibilities, etc.), would help to provide more tailored insight into regional solutions that solve regional issues.

Veterinarians and Veterinary Organizations

Researchers exploring veterinary capacity issues in other jurisdictions have also highlighted that veterinarians and veterinary organizations may benefit from increasing the use of RVTs in practice and broadening an RVT's scope of practice, thereby providing effective, professional, and cost-effective healthcare (Remsburg et al., 2007). Telemedicine could also support certain aspects of care (Sarita et al., 2015), which can be practised in Ontario under specific circumstances, for specific functions, as outlined by the CVO (CVO, 2018). Most interviewees highlighted these points.

Interestingly, nearly all practising veterinarians interviewed did not employ an RVT for large animal services. Though some had expressed interest, many suggested barriers/concerns regarding the costs of employing RVTs, time investment needed to train and educate them, limited scope of practice, potential risks associated with RVTs performing duties alone, and potential for clients to perceive the RVT as not adding as much value as the veterinarian. These sentiments have long been raised by certain subgroups of the veterinary profession, many of which represent perceived barriers and challenges that may not truly be present in practice, as evidenced by the successful integration of RVTs into clinical practice in numerous large animal clinics in southern Ontario and other regions. This speaks to the potential for attitudes to be a significant barrier in the use of RVTs, more so than real structural barriers.

The use of virtual consults and specific technologies to enhance efficiency, lower costs, and offer a broader set of services was often discussed. The use of digital post-mortems, conducted by trained technicians who then share digital

imaging with veterinarians for diagnosis, is used widely in some areas (Gaudet, 2015). In the developing world, community-based health workers, who rely on partnerships between veterinary authorities and livestock organizations, have also been used to support training and utilization of individuals such as RVTs (Leyland and Catley, 2002).

The CVO-led group has also developed objectives related to these topics:

1. Optimize the full utilization of the veterinary team

- Develop tools and case studies to assist veterinarians and RVTs to understand and implement full skill set utilization across the veterinary team
- Develop a business case for practice owners on the successful use of RVTs within the veterinary practice to support efficiency and effectiveness
- Develop and introduce relevant and accessible continuing education to support RVTs in assuming roles in food animal practice

2. Create cooperative veterinary practice models that promote shared services (i.e., human resources, equipment, infrastructure, etc.) for large animals in underserved communities to ensure the sustainability of veterinary services and the access to veterinary care by producers

- Identify veterinary practice owners interested in piloting cooperative practice models
- Develop cooperative business models for large and small veterinary practices that could be piloted to demonstrate efficacy for owners and clients

College of Veterinarians of Ontario

A number of veterinarians suggested that a potential strategy to improve veterinary access would be to bring in limited licensure for foreign-trained students, where they have a reduced scope of practice, but could competently offer a suite of services for livestock producers in rural areas. Offering this type of modified license might reduce barriers to

entry of these types of veterinarians. Implementing support programs (e.g. VSTEP) might then be a meaningful way to upskill these individuals and potentially enable them to qualify for a full license in Ontario.

The CVO-led group has tentatively set an objective around this topic as well, stating they seek to assure access to the skills of internationally educated veterinarians, by:

1. Utilizing existing licensure pathways that recognize focused scopes of practice
2. Developing new assessment tools that assure the competence of veterinarians wishing to practice in food animal practice only
3. Seeking funding sources to support implementation and assessment of proposed cooperative business models



Academia

Researchers exploring this issue in other jurisdictions have also highlighted that academic strategies to address this issue must include developing complementary degrees that motivate young graduates to seek work in rural and remote communities (Windsor, 2009), encouraging deeper learning on livestock health and production, offering more frequent and longer externships and rotations in these regions (Windsor, 2009; Eccles, 2018), and/or adjusting recruiting and admission requirements to increase access to rural students (Gwinner et al., 2006; Windsor, 2009). Enhancing professional development, early career support, and mentoring has also been suggested as important (Prince et al., 2006).

There was significant concern among most farmer groups that not enough is done in academia to promote veterinarians working in specific geographic areas of need. Many of these interviewees and focus group participants suggested that the OVC should reserve spaces for students coming from regions of need. It is important to note, however,

that preferentially selecting from certain regions does not necessarily ensure that graduates will relocate back home. Additional structures (incentives, expectations tied to preferential admission, etc.) would likely need to be in place to ensure graduates move to areas of need. Others suggested that the OVC reconsider and re-evaluate the admission requirements to focus less on grades and more on career interests, with a focus on mixed and large animal practice in areas of need.

Veterinarians, producers, and students emphasized the importance of providing more exposure to large animal veterinary medicine earlier in the DVM curriculum. Further, they noted it was important to include experiential opportunities for students to learn about and develop an interest in farming and rural lifestyles. Veterinarians in particular emphasized that recruiting veterinary graduates who are capable of “hitting the ground running” and who have a desire to reside in northern Ontario is a challenge. They felt strongly that students need more exposure to large animal medicine

earlier in their schooling, and more exposure to northern practices. Importantly, students stressed the need for additional required courses focused on large animal medicine to balance out their degree, noting they felt dissuaded to pursue large animal practice due to limited exposure early on. Further, students felt externships were a missed opportunity to experience northern Ontario, noting a significantly higher stipend to reflect cost of living and limited accommodations would encourage more students to seek these opportunities. Opportunities to interact with the farming community directly, increased hands-on experience with farm animals and formal networking/ mentorship events with existing large animal veterinarians in the north were all viewed as critically important enhancements for the program.

Perhaps the most notable area of discussion around academic opportunities to address this issue is to educate and train veterinary students in regions of need. As students studying in Guelph establish social relationships and a lifestyle in southern Ontario during their time of study, these roots ultimately

influence where they choose to practice once completing their schooling. This is not just true for veterinarians, but for most professions. For this reason, other sectors have invested in training options in different regions, with the notion that where one is educated and trained will have an influence on where they practice. This is the underlying concept behind the Northern Ontario School of Medicine, which has medical students complete some of their training in northern Ontario, and has been reported to have increased the likelihood that graduates will work in these regions.

Focus groups with current students were particularly informative regarding the role of academia to address this issue. Importantly, students routinely commented on limited exposure to large animals, lack of familiarity with farm settings and limited instruction from faculty during large animal courses (e.g. while working with horses). The most common concerns were related to limited experience and lack of confidence but for many, a keen interest to learn that was not fostered before they selected their chosen

specialization. The following program changes were noted by students:

- Exposure to large animals should occur earlier in the program, with greater instruction/mentorship from faculty
- Increased opportunities for field visits and hands on experience at the farm
- More meaningful mentorship with large animal veterinarians and veterinarians in the north

The CVO-led group has also established two long-term objectives focused on these activities:

1. Expand domestic DVM training, with the goal of graduating more rural mixed animal practitioners with a strong connection to underserved regions and an emphasis on team-based care

- Explore feasibility and business planning for expanded DVM training in Ontario
- Explore feasibility of different education and training models (i.e., increase domestic class size at Ontario Veterinary College (OVC), or a partnership program with another university)

- Develop an admission strategy that favours applicants wishing to work in underserved areas, combined with a strong mentorship program

2. Establish a system of incentives for students and graduates to train, work, and remain in underserved regions of the province

- Identify a suite of potential incentives to support students and new graduates in making a long-term lifestyle choice for rural food animal practice
- Study the benefits and drawbacks of incentive programs in other jurisdictions to assist with learnings for building an Ontario-centric incentive model
- Seek funding and partners which support a long-term incentive strategy

Conclusions

The underlying reasons for regional gaps in veterinary service are complex, and relate to socio-economic characteristics of the clientele (number and type of farms, trends for increase or decrease) and veterinary business (operational costs, revenue models, staff retention). Logistical, operational, and financial difficulties in serving large geographical areas with smaller populations also present unique challenges, and further limit opportunities to attract veterinarians to rural and remote areas. Local infrastructure (schools, hospitals, public services and amenities), personal factors (school debt, wage/salaries, career expectations) and social factors (lifestyle preferences, family opportunities and

supports) have also been identified as key barriers. Solutions to address this issue must therefore be multi-faceted, and focus on educational, financial, regulatory, personal, and professional approaches. There is considerable interest and engagement in this topic across federal and provincial governments, livestock associations and farmers, and veterinary associations and practitioners.

As no single organization owns this problem, leveraging this engagement and collaboratively developing a series of actions that can be championed by different groups will be key.



References

Alberta Veterinary Medicine Association and Alberta Veterinary Technician Association. 2021. *Veterinary Professional Workforce Project (VPWP) Final Report*.

American Veterinary Medical Association. 2020. Student AVMA: Facing Your Veterinary Medical Education. Available online at: <https://www.avma.org/membership/SAVMA/financing-your-veterinary-medical-education>

Andrus, D.M., K.P. Gwinner, and J.B. Prince. 2006a. Job satisfaction, changes in occupational area, and commitment to a career in food supply veterinary medicine. *JAVMA*. 228:1884-1893.

Andrus, D.M., J.B. Prince, and K.P. Gwinner. 2006b. Work conditions, job preparation, and placement strategies for food-animal veterinarians. *J. Vet Med Ed*. 33:509-516.

Baker, T., J. Flaig, M. Shillingford, L. Swain, and M. Wagner. Ice road vets: Perspectives on the role of veterinarians in northern community health. *Can Vet J*. 59: 668-672.

Beef Farmers of Ontario. 2020. *Expanding Ontario's beef industry*. Available at: <https://www.beefnorth.com/>

Blaauw, D., E. Erasmus, N. Pagaiya, V. Tangcharoensathien, K. Mullei, S. Mudhune, C. Goodman, M. English, and M. Lagarde. 2010. Policy interventions that attract nurses to rural areas: a multicounty discrete choice experiment. *Bulletin of WHO*. 88:350-356.

Behera, M.R., C. Prutipinyo, N. Sirichotiratana, and C. Viwatwongkasem. 2017. Interventions for improved retention of skilled health workers in rural and remote areas. *Ann Trop Med Pub Health*. 10:16-21.

Boissoneault, C., and T. Epp. 2018. Reflections on the provision of veterinary services to underserved regions: A case example using northern Manitoba, Canada. *Can Vet J*. 59: 492-499.

Card, C., T. Epp, and M. Lem. 2018. Exploring the social determinants of animal health. *J Vet Med Edu*. 45: 437-447.

Canadian Veterinary Medical Association. 2018. Veterinary Oversight of Antimicrobial Use – A Pan-Canadian Framework for Professional Standards for Veterinarians. <https://www.canadianveterinarians.net/documents/pan-canadian-framework>

Chapagain, T. 2017. Farming in Northern Ontario: Untapped Potential for the Future. *Agronomy*, 7(3), 59. <https://doi.org/10.3390/agronomy7030059>

College of Veterinarians of Ontario (CVO). 2018. Professional practice standard: Telemedicine. Available at: <https://cvo.org/getmedia/57fa4e6f-3bbb-4596-9d89-c5f5a4772bd4/Telemedicine.aspx> Last visited on: April 14, 2020.

College of Veterinarians of Ontario. 2015. Ontario Veterinary Stewardship of Antibiotic Use in Food-Producing Animals.

College of Veterinarians of Ontario, & Ontario Association of Veterinary Technicians. 2018. *Achieving a Modern Approach to the Regulation of Veterinary Medicine in Ontario*. <https://cvo.org/CVO/media/College-of-Veterinarians-of-Ontario/Resources%20and%20Publications/Reports/ConceptReportFeb2018.pdf?ext.pdf>

Council for Agricultural Science and Technology. 2020. Impact of recruitment and retention of food animal veterinarians on the U.S. food supply. Available at <https://www.cast-science.org/publication/impact-of-recruitment-and-retention-of-food-animal-veterinarians-on-the-u-s-food-supply/> Last visited on: February 18, 2021

Eccles, H.E. 2018. A descriptive study of a rural community veterinary practice in Ontario, Canada. MSc Thesis from the Department of Population Medicine, Ontario Veterinary College, University of Guelph.

Gaudet, A. 2015. Roles and opportunities for technicians in digital imaging technology to perform necropsies. 48: 185-187. Proceedings from the American Association of Bovine Practitioners Annual Meeting, New Orleans, U.S.

Government of Canada. 2020. Rural and Northern Immigration Pilot. <https://www.canada.ca/en/immigration-refugees-citizenship/services/immigrate-canada/rural-northern-immigration-pilot/community-partners.html>

Government of New Brunswick. 2021. Veterinary Field Services. https://www2.gnb.ca/content/gnb/en/departments/10/agriculture/content/livestock/veterinary_services.html

Government of Ontario, Ministry of Health and Long-Term Care. 2021. *HealthForceOntario Northern and Rural Recruitment and Retention Initiative Guidelines - Northern Health Programs - Health Care Professionals - MOHLTC*.

Gwinner, K.P., J.B. Prince, and D.M. Andrus. 2006. Attracting students into careers in food supply veterinary medicine. *JAVMA*. 228:1693-1704.

Health Canada. 2017. Antimicrobial resistance and animals – Actions. Available at: <https://www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/animals/actions.html> Last visited on April 15, 2020.

Lem, M. 2019. Barriers to accessible veterinary care. *Can Vet J*. 60:891-893.

Jensen, K. L., English, B. C., Menard, R. J., & Holland, R. E. 2009. Livestock producers' views on accessing food-animal veterinary services: Implications for student recruitment, training, and practice management. *Journal of Veterinary Medical Education*, 36(1), 30–38. <https://doi.org/10.3138/jvme.36.1.30>

Leyland, T. and A. Catley. 2002. Community-based animal health delivery systems: Improving the quality of veterinary service delivery. Proceedings of the OIE Seminar “Organization of Veterinary Services and Food Safety” at the World Veterinary Congress, Tunis, September 2002.

Lowe, P. 2007. Unlocking Potential: A report on veterinary expertise in food animal production. Available at: https://eprint.ncl.ac.uk/file_store/production/157494/88D16007-9B91-460D-A5D9-94E17A5CACCA.pdf Last visited on April 15, 2020.

Ministry of Municipal Affairs and Housing. 2011. *Growth Plan for Northern Ontario*. Government of Ontario.

Ministry of Energy, Northern Development, and Mines (MENDM). Veterinary Assistance Program. Available at: <https://www.mndm.gov.on.ca/en/northern-development/business-support/veterinary-assistance-program> Last visited on: April 15, 2020.

Noble, N., Occhiuto, F., Lovatt, F., Johnson, M., Jones, W., & Kaler, J. 2020. Impact of Flock Health Clubs. *Livestock*, 25(6), 301-307. <https://doi.org/10.12968/live.2020.25.6.301>

Northern Alberta Development Council (NADC) 2010. Community Recruitment and Retention: “Recruit” the physician and “retain” the family. Available at: <https://www.nadc.gov.ab.ca/Docs/RPAP-Workshop-10.pdf> Last visited on: April 15, 2020.

Northern Ontario Heritage Fund Corporation (NOHFC). 2020. Northern Ontario Internship Program. Available at: <https://nohfc.ca/en/pages/programs/northern-ontario-internship-program> Last visited on: April 15, 2020.

Northern Ontario Heritage Fund Corporation. 2021b. People and Talent Program: Workforce Development Stream. Government of Ontario. <https://nohfc.ca/en/pages/programs/people-talent-program/workforce-development-stream>

Northern Ontario School of Medicine. 2021. *About NOSM*. <https://www.nosm.ca/about/about-nosm/>

Northern Producer Animal Health Network. 2020. *What is NPAHN?*
<https://northernproduceranimalhealthnetwork.ca>

Ontario Ministry of Agriculture Food and Rural Affairs. 2016a. *Northern Livestock Pilot Action Plan*. Government of Ontario. <http://www.omafra.gov.on.ca/english/policy/nlpap.htm>

Ontario Ministry of Agriculture Food and Rural Affairs. 2016b. *Northern Ontario Agri-Food Strategy*. Government of Ontario. <http://www.omafra.gov.on.ca/english/northernagrifood/noas.htm#Principles>

Ontario Ministry of Agriculture, Food, and Rural Affairs. 2018. Growing Forward 2. Government of Ontario. <http://www.omafra.gov.on.ca/english/about/growingforward/gf2-index.html>

Ontario Ministry of Agriculture Food and Rural Affairs. 2021. Governments increasing veterinarian capacity for Ontario farms. Available at: <https://news.ontario.ca/en/release/1001439/governments-increasing-veterinarian-capacity-for-ontario-farms> Last visited on February 18, 2022

Ontario Veterinary Medical Association (OVMA). 2013. Ontario bovine veterinary practice census report. Internal OVMA report.

Prince, J.B., D.M. Andrus, and K. Gwinner. 2006. Future demand, probable shortages, and strategies for creating a better future in food supply veterinary medicine. *JAVMA*. 229:57-69.

Remsburg, D.W., D.T. Galligan, and J.D. Ferguson. 2007. A proposed novel food animal health care delivery system. *JAVMA*. 231:854-860.

Rural and Northern Immigration Pilot (RNIP). 2020. About the pilot. Available at: <https://www.canada.ca/en/immigration-refugees-citizenship/services/immigrate-canada/rural-northern-immigration-pilot.html> Last visited on: April 15, 2020.

Sarita, D. R.D. Singh, R.S. Ghasura, M.K. Sharma, and M.C. Sharma. 2015. Telemedicine: A new rise of hope to animal health care sector. *A Review. Ag. Reviews* 36:153-158.

Schelling, E., K. Wyss, M. Bechir, D., Moto, and J. Zinsstag. 2005. Synergy between public health and veterinary services to deliver human and animal health interventions in rural low-income settings. *BMJ Edu Deb.* 331: 1264.

Statistics Canada. 2018. Table 32-10-0012-01 *Number of persons in the total population and the farm population, for rural areas and population centres classified by sex and age.*
DOI: <https://doi.org/10.25318/3210001201-eng>

Truchet, S., N. Mauhe, and M. Herve. 2018. Veterinarian shortage areas: what determines the location of new graduates? *Rev. Ag. Food Environ.* 98:255-282.

Wasson, E. and A. Wieman. 2018. Mental health during environmental crisis and mass incident disasters. *Vet Clin North Am Food Anim Pract.* 34:375-388.

Winder, C.B., S.J. LeBlanc, D.B. Haley, K.D. Lissemore, M.A. Godkin, and T.F. Duffield. 2016. Practices for the disbudding and dehorning of dairy calves by veterinarians and dairy producers in Ontario, Canada. *J Dairy Sci.* 99:10161-10173.

World Health Organization (WHO). 2010. Increasing access to health workers in remote and rural areas through improved retention: Global policy recommendations. WHO Publications, Geneva, Switzerland.