Real-Time Virtual Support

Year One Evaluation Report

Reporting period:
April 1, 2020 – March 31, 2021

Prepared by:
UBC Digital Emergency Medicine

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THE UNIVERSITY OF BRITISH COLUMBIA
Department of Emergency Medicine
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The Real-Time Virtual Support logo was designed by Doug (Bear) Horne, the son of master carver, Doug Lafortune from Tsawout First Nation, and Kathleen Horne from Pacheedaht First Nation. Doug has grown up in the Tsawout community and, since early childhood, been immersed in Coast Salish art, learning from his father, uncles and family members who have generously shared their knowledge and expertise with him. He has dedicated over 25 years to creating Coast Salish art, and has worked in various art forms.

There is meaning behind the logo created by Bear. Hummingbirds symbolize messengers, healers, and peace. They also help guide and support us through challenge. The sun, meanwhile, represents life-giving abundance with warmth—a provider of healing energy and peace.

We gratefully acknowledge the Joint Standing Committee on Rural Issues for being the primary funder of the RTVS Evaluation. We also gratefully acknowledge additional financial support from the Rural Coordination Centre of BC, BC Academic Health Sciences Network, and UBC Department of Emergency Medicine through the BC Emergency Medicine Network and the BC Ministry of Health.

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Executive Summary

Equitable access to care is a fundamental issue across BC's rural, remote, and Indigenous communities. In response to the COVID-19 pandemic, the provincial rural framework, and building on long-time advocacy, Real-Time Virtual Support (RTVS) has been rapidly implemented provincially. Four publicly funded RTVS pathways launched in April 2020, and three new pathways launched in July and August 2020.

Real-Time Virtual Support Pathways

First Nations Virtual Doctor of the Day (FNvDoD), Substance Use and Psychiatry Service (FNvSUPS), and HealthLink BC Emergency iDoctor in-assistance (HEiDi) are patient-facing pathways that increase access to timely, appropriate virtual care for patients in BC. Rural Urgent Doctor in-aid (RUDi), Rural Outreach Support group (ROSe), Child Health Advice in Real-time (CHARLiE), and Maternity and Babies Advice Line (MaBAL) provide on-demand, peer-to-peer support to health practitioners in their communities, thereby improving equitable access to collegial support, decreasing isolation, and strengthening interprofessional relationships. All use virtual technologies to connect rural communities with enhanced resources and expertise.

Collaborative Evaluation

A provincial virtual health collaborative, consisting of stakeholder partner organizations and guided by a multisectoral Advisory Committee, undertook an evaluation of the RTVS initiative to understand ***how these novel virtual health services have impacted access and equity for patients and providers.*** The evaluation used a developmental, participatory approach and included interviews with policymakers, health professionals, and community end-users. Evaluation documented the progress made to address the COVID-19 crisis and support rural, remote, and Indigenous communities.

Guiding Metaphors and RTVS Values

RTVS addresses gaps in the healthcare system, with special attention to rural/remote emergency care. The First 90 Days Report of RTVS established four metaphors reflecting its values: a ***safety net*** for patients to access timely, appropriate care wherever they are in BC; a ***funnel*** point for patients to connect to longitudinal team-based care; a ***fire department*** for activities provided outside of acute support ("fighting fires"), including outreach, education, mentorship, and capacity-building for vulnerable providers in rural settings. Above all, high-quality ***culturally safe care and humility*** must be the beating heart within how virtual services are designed and delivered.

Evaluation Findings

The Year 1 evaluation of RTVS demonstrated several tangible benefits to both BC patients and rural providers, including:

- Improved accessibility of care for rural communities to meet individual health needs.
- Reduction of out-of-pocket costs for patients seeking care.
- Fosters patient-centred care by bridging specialties and transfers in a timely manner.
- Relationship-building among physicians and care team that fosters community of practice.
- Increased confidence and reduced isolation of physicians and nurses in rural and remote areas.
- Increased mentoring and education opportunities for providers, especially new-to-practice residents.

Year 1 Recommendations

Based on the robust data collected, we offer a list of evidence-based recommendations, which can sustain and improve RTVS in the long-term and address ongoing healthcare inequities with respect to Indigenous, rural, and remote communities. See the full report for further details and context.

Service Delivery and Practice

1. Increase integration of RTVS to complement, strengthen, and sustain existing community health services (e.g., brick-and-mortar situated care).
2. Continue to develop pathways to address emergent needs and current care gaps to continue reducing service inequities.

Rural Education, Confidence, and Competency

3. Embed educational activities as a key component of the peer-to-peer pathways to increase rural capacity and knowledge exchange.
4. Formally embed RTVS into medical education and training to empower emerging health professionals, foster bidirectional learning, and normalize virtual care.

Culturally Safe Practice

5. Model culturally safe care in virtual spaces through recruiting virtual practitioners that embody cultural humility and supporting ongoing cultural competency training and professional development.
6. Support the current work incorporating traditional practice into the virtual space for fulsome team-based care.
7. Incorporate patient and end-user experiential approaches in evaluation and share formative feedback with RTVS providers.

Culture Change

8. Model "call a friend" mentality at all levels of practice to lower barriers to accessing collegial support.
9. Promote benefits of RTVS to new communities/providers to raise awareness and promote usage.
10. Advocate for ways to strengthen rural resilience/resourcefulness to deliver care to patients in these communities.

Health System Change

11. Continue to advocate for solutions that address structural inequities, including the digital divide.
12. Implement and iteratively assess shared technology platforms to broaden connectivity and facilitate scale-up.
13. Embed virtual care options into primary, team-based care services to make available virtual team practices anywhere in the province.
14. Apply complementary, well-aligned compensation models for non-traditional service delivery models to promote sustainability.

Supporting a Learning Health Ecosystem

15. Leverage a networked approach to enhance a BC-wide community of practice to support enhanced care, continuous improvement, and ongoing learning opportunities.
16. Communicate and share evidence outwardly across sectors for system integration and change (for and by inclusive range of representative partner/audiences).
17. Engage stakeholders across sectors in planning work to carry recommendations forward, taking into account resource intensity, leadership, priority level, and opportunities for participation and contribution.

Looking Ahead

The RTVS collaboration embodies a Learning Health Ecosystem, with communities of practice that gather and cooperate to reflect on practice, engage in quality improvement efforts, and innovate services moving forward. Building on the strong foundation of partnerships and relationships, this work is grounded in community and patient-centred, team-based care. It brings together communities, health professionals, health service administrators, academia, decision-makers, and linked sectors – ***all focused on the common goal of advancing equity and wellness for rural, remote, and Indigenous communities in BC.***

Real-Time Virtual Supports in BC (RTVS)
HIGHLIGHTS & IMPACT 2020 - 2021

In response to the COVID-19 pandemic, Real-Time Virtual Support (RTVS) was rapidly implemented in BC. Since launching in April 2020, RTVS services and pathways have evolved and grown, continuing to advance equitable access to care for all British Columbians and on-demand, clinical support to vulnerable healthcare providers working in low-resource communities throughout BC.

Pathways Built on Strong Partnerships

First Nations Virtual Doctor of the Day (FNvDoD)& Substance Use and Psychiatry Service (FNvSUPS)

Enables First Nations people in BC with limited or no access to their own health and wellness team to make virtual appointments

HEiDi (HealthLink BC Emergency iDoctor-in-assistance)

Virtual physicians integrated into provincial 811 nurses' call flow

24/7 **On-Demand Support for Rural Healthcare Providers**

ROSe – Rural Outreach Support group (intensivists on call, launched 04/2020)
RUDi – Rural Urgent Doctor in-aid (emergency medicine colleagues on call, launched 04/2020)
CHARLiE – Child Health Advice in Real-time Electronically (Pediatrics pathway, launched 07/2020)
MaBAL – Mother and Baby Advice Line (launched 08/2020)

Advancing Equity and Access in BC

Peer-to-Peer RTVS Pathways

29,544 hours of support offered

2,505 cases of varying complexity handled

91 unique BC communities accessing RTVS

"We get better care and support because they can devote all their time" - Remote Community Nurse, RTVS end-user

Patient-facing Pathways: First Nations Virtual Care

6,028 FNvDoD encounters since 04/2020

1,112 FNvSUPS encounters since 08/2020

+95% clients recommend to family/friends

"Everything was perfect right to the receptionist making the appointments to the doctor talking with me....one of the best doctor's appointments that I have had." - FNvDoD Client

Patient-facing Pathway: HEiDi

30,682 HLBC encounters served by HEiDi virtual physicians since 04/2020

75% HEiDi patients diverted from ED visits

17% accelerated to ED visits

"I appreciated speaking to an Emergency Room doctor who helped me decide what action to take next." - HEiDi caller

Guiding Metaphors and RTVS Values Evidenced through Evaluation

Establishing a safety net to support patients virtually with just-in-time access to high quality and personalized urgent care services

Using these pathways through which patients enter the health system to funnel them towards primary care attachment and primary care networks

Cultural safety must be the beating heart within how virtual services are designed and delivered -- health care service to actualize mutual care for each other as human beings.

Building a health system "fire station" to address urgent cases while supporting health providers and building local capacity through knowledge exchange

We gratefully acknowledge financial support from the Rural Coordination Centre of BC, the Joint Standing Committee on Rural Issues, BC Academic Health Sciences Network, the UBC Department of Emergency Medicine through the Emergency Medicine Network, and the BC Ministry of Health.

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Introduction

Virtual care and support services have long been advocated for in BC, as novel, innovative methods needed to address long-time health and access inequities experienced by rural, remote, and Indigenous communities and the vulnerable healthcare providers serving them. Prior to 2020, this has led to various on-demand virtual support initiatives, such as CODI and the Robson Valley Virtual Care pilot project. As the COVID-19 pandemic hit British Columbia in early 2020, the Real-Time Virtual Support (RTVS) initiative rapidly formalized and launched several virtual pathways in response. Underpinned by a strong network of partnerships built on trust and integrity, RTVS was quickly implemented with the core, shared objectives of:

- Increasing patient access to timely, appropriate virtual care, especially for rural, remote, and Indigenous citizens.
- Increasing access to virtual collegial support to vulnerable healthcare practitioners serving rural, remote, and Indigenous communities.

In the past year, we have seen RTVS grow from four to seven patient-facing/peer-to-peer pathways, plus the development and implementation of several "quick reply" support lines. Our evaluation thus far of the seven pathways has been iteratively guided by input from key stakeholders. We have produced First 90 Days and 6-Month reports to describe our evaluation approach and highlight the initial successes of RTVS. In this Year 1 Report, we will comprehensively describe our evaluation activities to date and the significant findings, outcomes, challenges, and future directions identified.

Back to the Future: Enduring Themes & Strategies of RTVS

Before the formal outset of RTVS in March-April of 2020, the different leaders and stakeholders interested in virtual care for rural, remote, and First Nations communities in BC identified several shared goals for the rapidly coalescing initiative. One year later, we can reflect on and assess these aspirational goals and confidently mark them as ***concrete successes***. Now, we can view them as **enduring themes and strategies** to continue driving RTVS forward and markers of regular milestones. These enduring themes and strategies are:

- More widely **expose service to the rural medical community** to support providers and improve patient care.
- More widely **promote service to bolster rural recruitment and retention.**
- **Recruit and engage virtual physicians** who are encouraging, understanding, and interested in developing relationships with rural physicians.
- Develop a **faculty development program** to foster competencies required for a successful consultant, including soft skills, understanding rural practice context.
- Integrate with **longitudinal EMR** for continuity.

- Expand **to other specialty areas** as identified.
- Establish **reliable ongoing funding** to maintain real-time virtual support service and technical infrastructure.

For readers unfamiliar with RTVS, in the next subsection, we provide further background information to contextualize the need for RTVS.

Background

British Columbia is a geographically large province at 944,735 km^2, but has a relatively small population, estimated at 5,153,039 residents in 2021,[1] mostly clustered in urban centres and otherwise distributed in communities separated by great distance. Statistics Canada estimates about 14% of BC residents live in rural communities, generally defined as a community with less than 1,000 residents.[2] However, this is likely an underestimate, as the Rural Subsidiary Agreement (RSA) and Joint Standing Committee on Rural Issues (JSC) recognize 201 communities with varying degrees of medical isolation, which represent approximately 20% of BC residents.[3,4] **These demographics reflect the potential difficulty in delivering patient-centred, equitable healthcare to all BC residents, as well as adequately preparing and supporting healthcare providers that practice in rural and remote settings**.

Further, there are 203 First Nations in BC, with healthcare services provided by both their regional Health Authority and the First Nations Health Authority. **Indigenous patients need culturally safe, tailored, and accessible care** while addressing historical injustices outlined by the Truth and Reconciliation Commission. In November 2020, the *In Plain Sight* report reiterated the **urgent need for health system transformation** in order to address the "direct link between the history and experience of colonial healthcare in BC and the challenges of racism within the healthcare system today."[5]

Gaps in rural, remote, and Indigenous healthcare exist across Canada. A disproportionately smaller number of physicians practice in rural areas and residents of rural communities have poorer health and access to healthcare professionals.[6] While BC has a robust system for emergency patient transport, a recent report found that rural BC patients spend an average of $2,234 on out-of-pocket costs when needing to travel out of their community for a health issue.[7] The Review of Family Medicine Within Rural and Remote Canada, notes that more than 15 years ago "the First Ministers of Health set a target that by 2011 at least 50 per cent of Canadians should have access to an appropriate primary care provider 24/7 regardless of where they live."[6] This target continues to not be met. **In short, patients in rural, remote, and Indigenous communities do not have equitable access to healthcare in Canada.**[8]

For healthcare providers (physicians as well as nurses at remote stations) working in the isolated professional environment that is rural healthcare, urgent care cases can amplify feelings of being

alone, overwhelmed, and unsupported. Family physicians' fear of working in a rural emergency room can detract clinicians from practicing in rural locations,[8] compounding the health disparities experienced by patients in non-urban communities across the province. With 80% of hospital admissions in Canada originating from urgent care,[9] **Real-Time Virtual Support (RTVS) services for urgent healthcare issues can address the acute need of supporting vulnerable healthcare providers in BC.**

In British Columbia, there has been a decades-long push to develop innovative, virtual health services to address long-standing gaps in our healthcare system. An original and primary motivator for integrating virtual care is that, in many rural, remote, and Indigenous communities across the province, family physicians and primary care teams provide services to patients with limited support and resources. Additionally, for complex or urgent cases, finding solutions to avoid transporting patients out of their community is paramount, as road conditions, weather, geography, and the burden on patients and their families disproportionately impacts those in rural, remote, and Indigenous communities. The COVID-19 pandemic has thrown healthcare system gaps into stark relief, and has exacerbated challenges. Two such examples are the disruption and closure of local health services in First Nations communities and overwhelming nurses at HealthLink BC's 8-1-1 telephone service with surging volume of callers. The Canadian Institutes of Health Research (CIHR) have identified virtual care as one of seven key priority areas for health services and policy research to address such gaps.[10]

During the pandemic, nearly half of Canadians have used a telehealth/virtual service to access healthcare for their illness or condition, with patient satisfaction very high (91% satisfaction rate or greater) for these methods.[11,12] Relatedly in the USA, there has been a large shift in both consumer and provider interest in virtual health services.[13] Together, these trends indicate an unmet need and that people are increasingly expecting and wanting new virtual options for their health needs, as these on-demand technologies become more available.

The COVID-19 crisis is a disruptor and accelerator, causing rapid changes in the healthcare system, from technology deployment to a shift in privacy considerations. Concerning virtual care in BC, this has led to the **accelerated development and implementation of multiple RTVS pathways** to address various needs on the ground in communities and across regions.[i]

[i]The Joint Standing Committee on Rural Issues provisioned rural physicians and nurse practitioners with access to *Zoom for Healthcare* licenses. This access to a reliable virtual tool for rural providers and teams allowed them to connect with their patients virtually as required and provided access to RTVS supports. This contribution was a major enabler to standing up the RTVS pathways at the outset of the pandemic. To March 31, 2021 a total of 1,316 individual users were provisioned with Zoom licenses.

These RTVS pathways are underpinned by strong foundations of trust and partnerships, such as those embodied by the Virtual Health and Wellness Collaborative for Rural and First Nations BC ("*the Collaborative*"), as well as integrity, advocacy, and a pioneering spirit, which have paved the way for the rapid evolution and expansion of RTVS in response to the pandemic. COVID-19 has demonstrated that rapid changes can be made in how healthcare is delivered and how healthcare professionals can support each other virtually, enabling for accessible, equitable, patient-centred care.

Guide to this Report

This report offers a comprehensive description of evaluation outcomes for seven RTVS pathways at one year since launch. An overview will be given of the partnerships, collaboration, and working groups underpinning RTVS, as well as the three patient-facing pathways (HEiDi, FNvDOD, FNvSUPS) and four peer-to-peer support pathways (ROSe, RUDi, CHARLiE, MaBAL). Following this, the framework of evaluation will be discussed with respect to objectives, guiding metaphors, and methods. Findings will outline the usage and growth of the RTVS pathways, impact and experience for end-users and providers, community and system impact of RTVS, and stakeholder perspectives. Finally, this report will describe the key achievements, challenges, and next steps to guide the future direction of RTVS while remaining true to its core values of providing timely access to care to rural, remote, and First Nations citizens and on-demand collegial support to the vulnerable providers serving them.

Real-Time Virtual Support at One Year

In response to the aforementioned healthcare system gaps and the COVID-19 pandemic, seven RTVS pathways have been formally deployed since April 2020 to address specific needs. Each RTVS pathway and the broader RTVS initiative is firmly underpinned by key partnerships and foundational collaborations, captured as the Partnership Pentagram + model, derived from the World Health Organization's original formulation (Figure 1). These relationships have been developed over many years, if not decades in some cases, and have culminated in the deployment of the pathways.

Collaboration and Partnerships

On January 29, 2019, the Rural Coordination Center of BC led a Provincial Healthcare Partnership retreat with more than 250 leaders across BC participating to reflect on and shape changes to improve rural and First Nations health equity in BC. Healthcare partners and community-based stakeholder groups-initiated dialogue and explored solutions relevant to the ongoing challenges of healthcare access and delivery to First Nations and Non-First Nations rural remote

and remote communities in BC. In April 2019, the Virtual Health and Wellness Collaborative for Rural and First Nations BC" (the "Collaborative") was established. In the summer of 2020 a working group of partners coordinated by FNHA led the collaborative development of a "Memorandum of Understanding" to serve as an informative and guiding document.

Throughout the year, partners and collaborators connected largely virtually (via Zoom and other platforms) to work together and keep each other up-to-date. For example, each clinical pathway held regular "communities of practice" bringing together clinical, administrative, evaluation, and other personnel to plan, share learnings, and to solve ongoing and emergent issues. The "Collaborative" stakeholder advisory committee and working groups were held regularly to both guide and implement RTVS work. Regular "Real-Time Virtual Support" working group calls convened decision makers, community, clinical, administrative, educational, regulatory, evaluation, technology, communications, and other linked sector partners to share information and problem solve. Throughout the year, people across organizations and roles worked together largely virtually from various locations in the province. Committees and working groups on a continuum from formal/regularized to informal/ad hoc underscored how deepening relationships among individuals served to strengthen working partnerships among organizations.

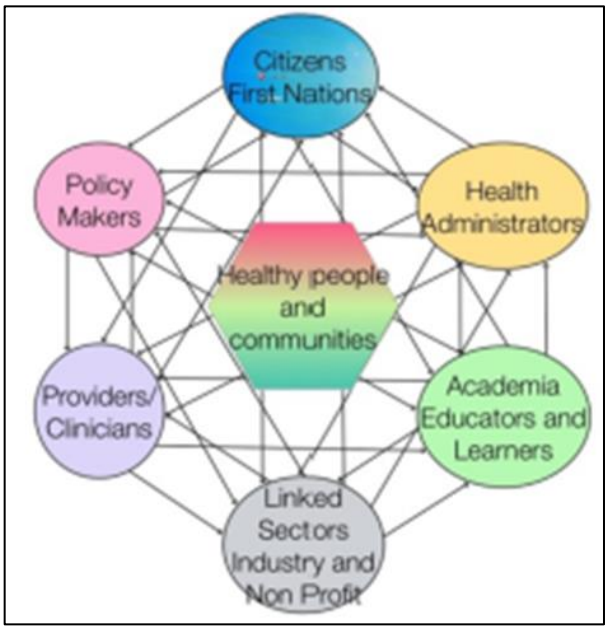


Figure 1: Partnership Pentagram+ model underpinning RTVS.

Building a Virtual Provider Team

The rapid development of RTVS in March/April of 2020 meant that a group of physicians were quickly recruited to take on the novel role of Virtual Physicians (VP). About 70 practicing physicians were rapidly recruited, carefully selected on the basis of, not only having excellent clinical expertise, but also being *non-judgmental, compassionate, strong communicators, experienced with different technologies, knowledgeable about rural BC, and experienced in different care settings* – **all essential qualities and skills for being an effective VP** during a pandemic. Since last year, the total number of VP's across the pathways has expanded to over 150 providers. The VP team is supported by key personnel at different organizations, including: virtual medical office assistants (VMOA) at HealthLink BC (a new position created to support HEiDi); MOA's at FNHA that support FNvDoD/FNvSUPS; administrative assistants from Providence Healthcare that support the peer-to-peer pathways; and tech experts from RCCbc that support the implementation and development of the RCCbc Zoom version and MOIS shared EMR (among others).

Each RTVS pathway has a dedicated Community of Practice (CoP) meeting series, facilitated by the pathway leads, where VP's meet regularly to learn about operational updates, present interesting clinical cases, and share useful knowledge and skills about practicing virtually. This supportive and collaborative environment is continued outside of meetings via Microsoft Teams, where VP's have dedicated channels to chat socially, provide updates, request immediate collegial support, and more. Based on a Year 1 survey completed by 52 VP's (details below in Report Methods), about 74.5% of VP's have taken a cultural competency training course (e.g., San'yas) either before or since working on RTVS.

Patient-Facing pathways

The aims of the three patient-facing RTVS pathways can be briefly summarized as: **to increase patient equity and access to timely, necessary care**, thus improving patient-centered continuity of care and linkage to existing primary care networks. FNvDoD and HEiDi launched in April 2020, with FNvSUPS coming online in August 2020.

1. **First Nations Virtual Doctor of the Day (FNvDoD):** launched April 1, the FNVDoD pathway provides any Indigenous person in BC access to scheduled consultations with a Virtual Physician (VP). The service runs seven days per week from 8:30am-4:30pm, is supported by several Medical Office Assistants (MOA), and has one VP is available per Health Authority.
2. **First Nations Virtual Substance Use and Psychiatry Service (FNvSUPS):** launched August 2020, trusted health and wellness providers, Knowledge Keepers and Elders can refer Indigenous clients to the service. Weekday appointments are available from 9:30am-5:30pm for addictions medicine or 10am-3pm for psychiatry. This service is unique in that it

encourages the referring provider or another community health support person to attend the specialist appointment with the client. This ensures that local knowledge is available to the specialist for care planning and that there is continued support for the client between appointments.

3. **HealthLink Emergency iDoctor in-assistance (HEiDi):** launched April 6, HEiDi integrates VP's into the standard telephone call flow for HealthLink BC's 811 Nursing Services. BC residents calling 811 and triaged with a "yellow" or "red" disposition (i.e., "seek care within 24 hours" or "see a MD now", respectively) can be referred immediately to a VP for a virtual consultation and additional clinical advice. VP's are currently available 9:00am-11:00pm daily, with six VP's taking six-hour shifts over the course of the day, plus an additional VP conducting follow-up consultations if clinically recommended or for quality assurance purposes.

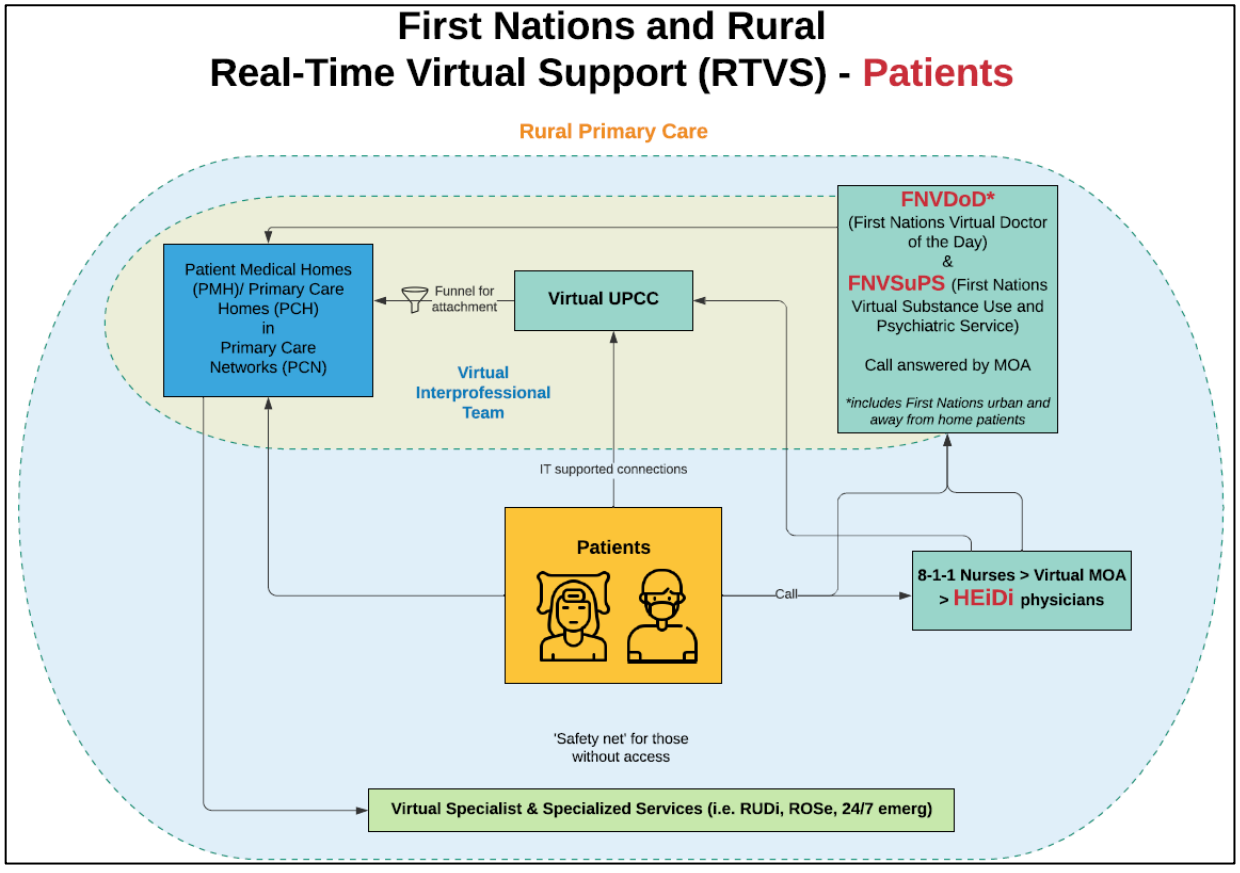


Figure 2: RTVS Patient-facing pathways.

On-Demand Peer-to-Peer Support Pathways

The aims of the four peer-to-peer RTVS pathways can be briefly summarized as: to **support rural, remote, and Indigenous practitioners in their local communities**, thereby decreasing

isolation and stress, improving practitioner recruitment and retention, and strengthening interprofessional and collegial relationships. ROSe and RUDi launched in April 2020, with CHARLiE and MaBAL launching in July and August 2020, respectively, to address specialist care needs. The peer-to-peer support pathways are:

1. **Child Health Advice in Real-time Electronically (CHARLiE):** Pediatricians, pediatric emergency physicians, and pediatric intensivists are available 24/7 by Zoom to provide urgent specialized pediatric support to rural healthcare providers who are presented with urgent problems in children and youth. Support includes providing a second opinion, reviewing a case, helping to navigate the healthcare system, and providing collaborative support.
2. **Maternity and Babies Advice Line (MaBAL):** Family physicians with expertise in maternal and newborn care and an understanding of the rural and cultural contexts are available 24/7 through Zoom and by phone to provide guidance on urgent and non-urgent pre-conception, prenatal, antenatal, intrapartum, and postpartum presentations, for both moms and newborns.
3. **Rural Outreach Support group (ROSe):** intensivists and critical care specialists are available 24/7 by Zoom, mobile app, and phone to support rural healthcare providers looking for a consultation, second opinion, or ongoing virtual support for patients.
4. **Rural Urgent Doctor in-aid (RUDi)**: launched April 1, physicians with emergency medicine and rural experience are available 24/7 by Zoom and phone to support rural healthcare providers with generalist medical problems, as well as education and simulation opportunities.

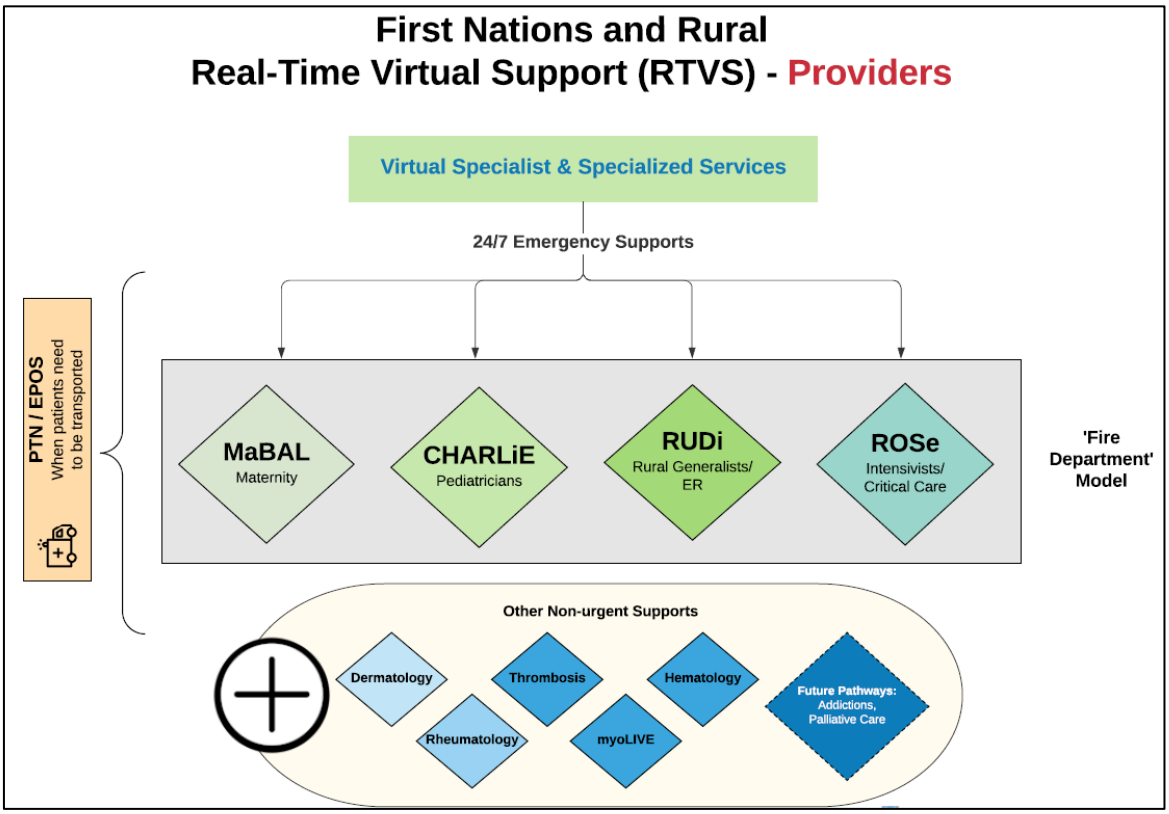


Figure 3: RTVS Peer-to-peer support and Quick Reply pathways.

Peer Support "Quick Reply" Pathways

BC healthcare providers and stakeholders have also recognized the need for further specialist support provided under the RTVS umbrella. A Dermatology RTVS pathway has been available to provide rural/remote clinicians with access to specialist virtual support with diagnosis, acuity, treatment, and referrals for dermatological cases. There are also pathways available to assist rural healthcare providers in rheumatology (RheumVision), hematology (Clinical Hematology), and myofascial pain presentations (myoLIVE – Link Immediately to Virtual Experise), as well as direct patient support in thrombosis medicine (Thrombosis Medicine).

For this Year 1 Evaluation, we have not formally evaluated these Quick Reply pathways. We recognize that this is a limitation for this report, as these are important elements of the RTVS initiative, both in terms of its foundation and ongoing evolution. We will expand our ongoing evaluation to capture outcomes from these Quick Reply pathways.

Evaluation Approach

The Year 1 RTVS evaluation was iterative, participatory, and developmental in nature. At the outset of RTVS in March/April of 2020, the evaluation was grounded in the Quadruple Aims framework and our previous work in digital health and virtual care initiatives (e.g., CODI). For the First 90 Days phase, we conducted a rapid evaluation of key outcomes and interviews with stakeholders, policymakers, and pathway leads. This initial phase laid a strong foundation for the Year 1 evaluation and enabled us to "point the RTVS rocket in the right direction."

Over the past year, we have held monthly meetings of the Evaluation Advisory Committee (with members representing RTVS pathway leads and other stakeholders), which provided ongoing iteration of the evaluation approach. Similarly, we have regularly participated in different Working Groups, pathway Communities of Practice, and other formal/informal meetings, which has enabled us to strengthen our collaborative evaluation approach and document impact and feedback.

This summative report comprehensively describes the Year 1 evaluation of RTVS. In the subsections below, we describe the primary evaluation objectives of this report, the current evolution of our evaluation framework, and the specific methods used to collect data.

Objectives

The RTVS evaluation objectives are built from the initiative's original, core guiding principles:

- ***RTVS improves access to and equity of care for rural, remote, and Indigenous patients.***
- ***RTVS enables rural healthcare providers to access on-demand support from colleagues who understand the rural care context.***

Based on these core values, we outline eight core objectives that the RTVS seeks to realize as long-term impacts and that evaluation seeks to demonstrate (Figure 4).

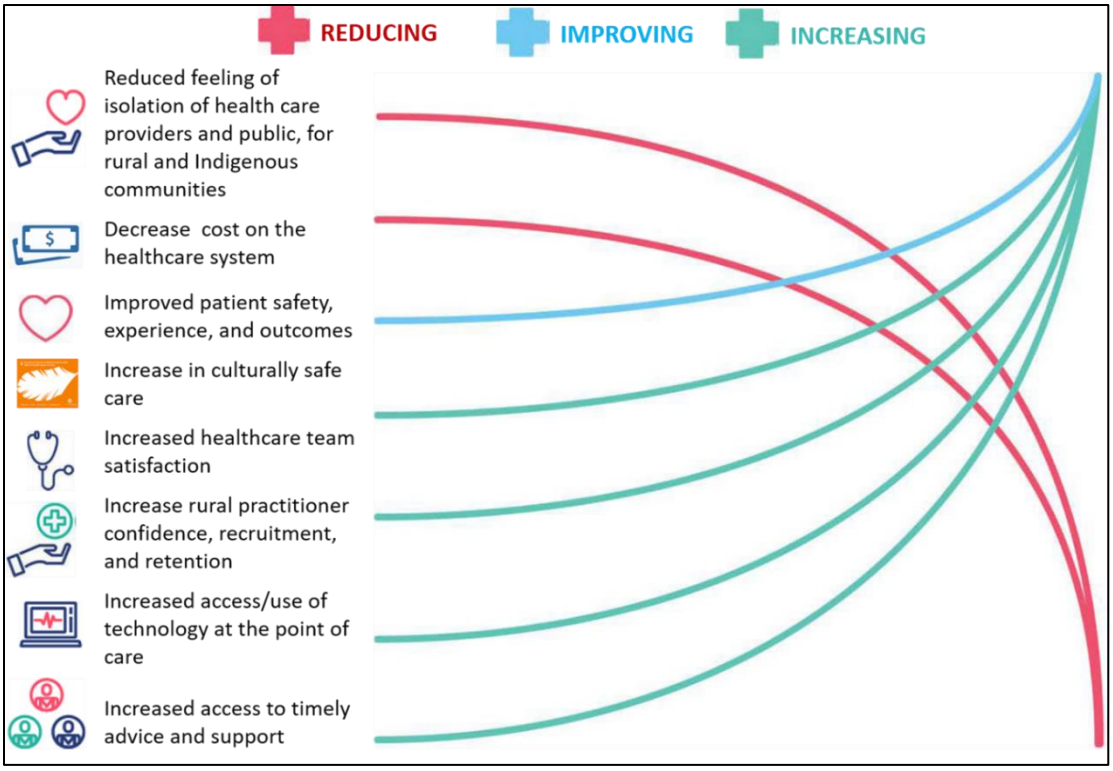


Figure 4: Anticipated long-term impacts of RTVS pathways

Guiding Metaphors and Framework

The F90D phase conducted extensive interviews with key RTVS stakeholders, policymakers, and pathway leads, leading to the distilment of four guiding metaphors:

The Safety Net, reflecting how RTVS can provide ***timely, equitable access to care***, irrespective of where patients are located in BC. This is especially relevant during the COVID-19 pandemic, where many in-person primary care services have been limited and citizens are feeling more anxious.

The Funnel, indicating how RTVS can help patients ***navigate the health system*** (during the COVID-19 pandemic) and ***connect patients to appropriate longitudinal, primary care***.

The Fire Department, representing the ***diverse community engagement activities*** provided by RTVS physicians (e.g., outreach to new communities, capacity building through education and simulations)

The Feather (added after the F90D report), reflecting the need for ***high-quality culturally safe care*** to be provided to Indigenous patients.

These four metaphors help anchor the full RTVS evaluation framework, as well as contextualizing the core, original principles of RTVS. In this report, we will similarly use the guiding metaphors to highlight key findings and provide them within a meaningful context.

This Year 1 report is underpinned by a robust evaluation framework. Like the overall evaluation approach, this framework has undergone several iterations, being shared regularly with various internal and external RTVS stakeholders for their input. In the current development, our evaluation framework incorporates domains from several validated sources, including the Quadruple Aims, Social Accountability, BC Patient Safety & Quality Council Matrix, and Benefits Realization frameworks. The full evaluation framework (see Appendix) lists the key evaluation questions for RTVS, linking them to the four guiding metaphors and cross-referenced with existing frameworks, specific measures/indicators, and data sources.

Further, with this iterative approach and current version, the evaluation framework sets a strong foundation for sustained evaluation of the RTVS pathways to document and communicate impacts in the short- and long-term. Also, we will utilize this evaluation framework to integrate a Learning Health System approach in the next year.

Methods

We used a mixed-methods approach to address complexity and combine quantitative measurement with systematically captured experiences and narratives to illuminate key findings. Through this integrated "stories and statistic" approach, we seek to comprehensively analyze and contextualize all relevant findings in this summative report. Below, we provide an overview of the different data sources and collection methods utilized (details of evaluation data collection tools are listed in the Appendix):

- ***Key informant interviews*** with RTVS stakeholders, providers, and end-users. All RTVS providers and pathway leads were invited to participate in interviews. We used internal contact lists to identify end-user providers of RTVS peer-to-peer pathways and invite them to participate in interviews. Interviews used a semi-structured guide to illuminate important themes, as well as inform high-impact case studies. See Table 1 for a breakdown of the number of interview participants.
- All RTVS providers were invited to complete an online ***survey related to their experiences over the past year***. See Table 2 for a summary of survey respondents.
- ***FNvDoD- and FNvSUPS-specific:*** FNHA shared summaries of their internal reports related to encounter-level metrics and client surveys, respecting OCAP principles.
- ***HEiDi-specific:*** HealthLink BC shared extracts from their internal databases for analysis of encounter-level metrics and patient survey responses.

- ***RUDi, CHARLiE, and MaBAL-specific:*** VP's were asked to complete a short form at the end of each shift, indicating the number of calls received, communities of origin, medical problems supported, etc.
- ***ROSe-specific:*** The pathway leads shared internal summaries of encounter numbers.
- Various ***internally-maintained administrative databases*** provided further information relevant to the number of RTVS providers currently working, number of providers with access to the shared MOIS EMR, technology issues, etc.
- Finally, analogous to ***"field notes"***, data were also informally collected via meetings, email threads, Slack/Teams posts, etc. to further document impacts of RTVS (e.g., spontaneous patient or provider feedback), track ongoing operational issues/challenges, and contextualize other findings.

Other evaluation activities, which informed ongoing evaluation included collaboration with UBC Continuing Professional Development on an RTVS needs assessment survey, which provided information on awareness of RTVS pathways, and preferences for qualities of virtual consultants. The evaluation team also assisted by developing just-in-time surveys such as virtual physician perspectives on remuneration, scheduling, or scope of practice. Findings of these types of surveys were used in the context of clinical communities of practice. Clearly demonstrated above, we recognize that this evaluation relies on extensive collaboration with many partners, to whom we are grateful for facilitating access to these data. We also acknowledge different limitations in our evaluation and methodology, which will be listed in the Discussion.

Table 1: Number of RTVS Interview Participants.

RTVS Virtual Physicians (by pathway)*	**Number of Interviews**
HealthLink BC Emergency iDoctor in-assistance (HEiDi)	6
Rural Urgent Doctor in-aid (RUDi)	8
Child Advice in Real-time Electronically (CHARLiE)	2
First Nations Virtual Doctor of the Day (FNvDoD)	6
Mother and Baby Advice Line (MaBAL)	7
Rural Outreach Support group (ROSe)	4
RTVS End-Users (e.g., community nurses, residents, locum providers)	10
Other Health Personnel (e.g., 811 nurses, pathway MOA's)	4
RTVS Stakeholders/Leads	16
Policymakers & External Stakeholders	8
Total Interviews Conducted	***71***
**31 unique VP participants were interviewed: 2 participants work on multiple pathways and 2 were interviewed multiple times.*	

Table 2: Number of Respondents to Year 1 VP survey.

Pathway	Number of Respondents	Percentage (%)
HealthLink BC Emergency iDoctor in-assistance (HEiDi)	24	40.7
Rural Urgent Doctor in-aid (RUDi)	13	22
Child Advice in Real-time Electronically (CHARLiE)	5	8.5
First Nations Virtual Doctor of the Day (FNvDoD)	5	8.5
Mother and Baby Advice Line (MaBAL)	4	6.8
Subspecialty line (e.g., dermatology, rheumatology, thrombosis, myoLIVE, hematology)	3	5.1
First Nations Virtual Substance Use and Psychiatry Service (FNvSUPS)	2	3.4
Other	2	3.4
Rural Outreach Support group (ROSe)	1	1.7
52 VP's completed the survey. 7 indicated that they worked on multiple pathways.		

Findings

In this section, we present the comprehensive findings from the Year 1 evaluation. Findings are displayed according to overarching areas of evaluation, themes, and priorities (see above). This contrasts with previous reports, where results were typically presented on a pathway-by-pathway basis. Instead, given the scope of the evaluation and amount of data collected, we use a narrative approach and structure to increase interpretability and relevance of these results.

Usage & Growth: Operational Highlights

In April 2020, four RTVS pathways launched, with three new pathways coming online in July/August 2020. Over the 8-12 months that the pathways have been active, all have seen tremendous growth in terms of utilization (Table 3). Integral to understanding the drivers of increased utilization is characterizing *who* is accessing RTVS, including the community or Health Authority of where the patient or provider is located. Where possible, we describe the demographic characteristics of users accessing RTVS. In the following subsections, we share insights from RTVS providers, community healthcare providers, and patients/clients as to *how* and *why* these pathways are being increasingly accessed across BC.

Table 3: Summary of encounter/call numbers and change over time.

	Total encounters/calls	First half*	Second half	% Change
FNvDoD	6,034	1,796	4,238	***+136%***
FNvSUPS (launched Aug 2020)	1,112	334	778	***+133%***
HEiDi	30,682	11,449	19,233	***+68%***
CHARLiE (launched July 2020)	221	88	133	***+51%***
MaBAL (launched Aug 2020)	162	34	128	***+276%***
ROSe	598	269	329	***+22%***
RUDi	1,524	414	1,110	***+168%***
**For FNvSUPS and MaBAL, the "first half" represents August through November (4 months). For CHARLiE, the "first half" represents July through November 15 (4.5 months).*				

FNvDoD & FNvSUPS

The FNvDoD and FNvSUPS pathways have served 2,693 and 399 unique clients, respectively. This translates to an *average of 2.2 and 2.8 encounters per client*. This repeat usage by Indigenous clients reflects that these pathways are able to provide ***timely access to high-quality, culturally safe care***. FNvDoD is reaching about *200 new clients per month* and FNvSUPS is *reaching 40*.

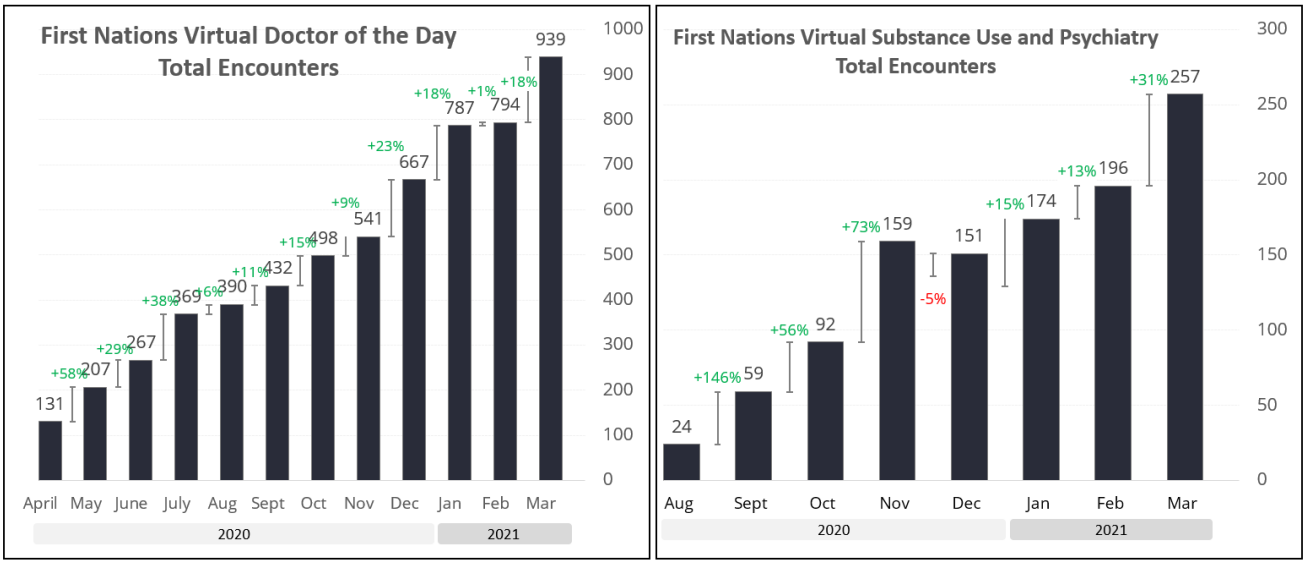


Figure 5: Monthly encounter volumes for the FNvDoD and FNvSUPS pathways.

55% of clients of the FNvDoD pathway are from Northern or Vancouver Island Health Authorities, while 40% of FNvSUPS clients are from Northern Health Authority. Frequent usage by clients from these regions suggests that these ***services are addressing previously identified healthcare inequities.***

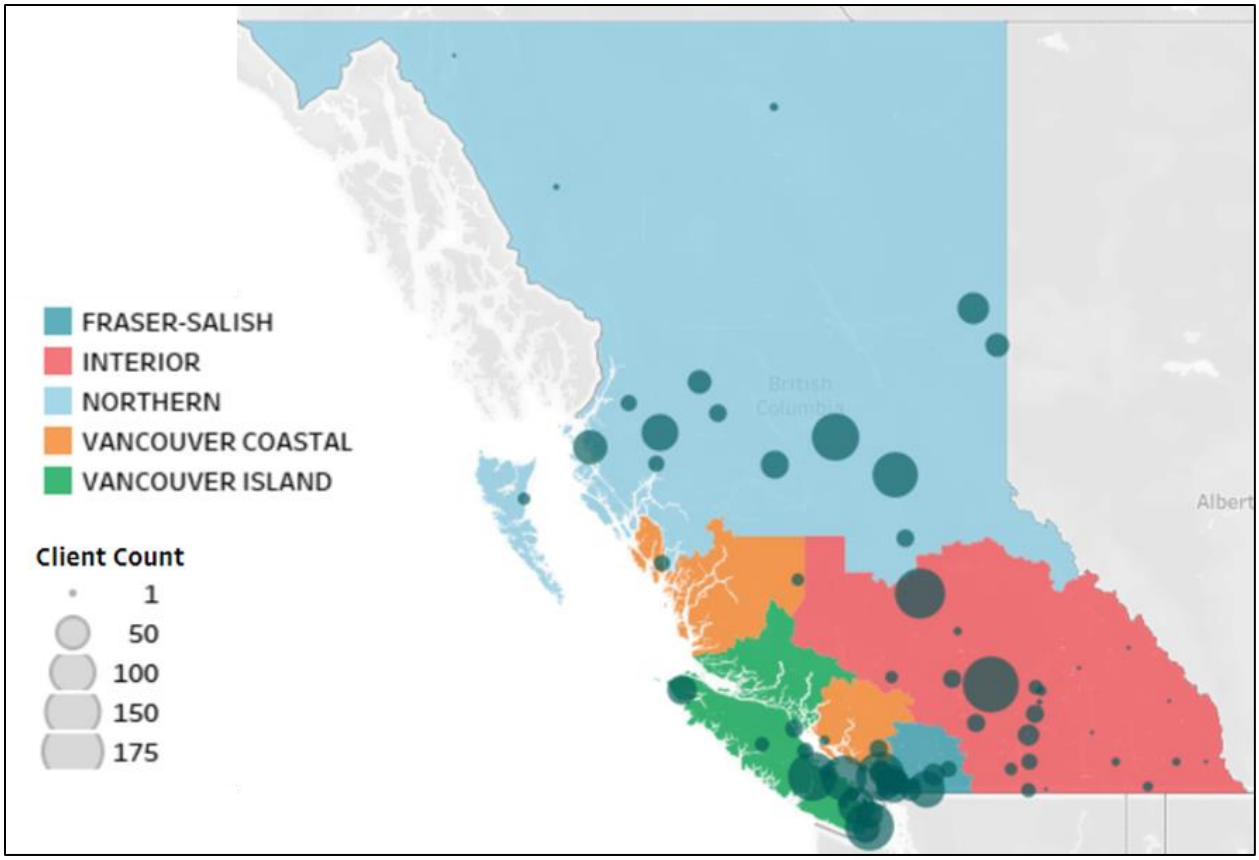


Figure 6: Map of client locations for the FNvDoD pathway.

Further details about the encounter lengths and Health Authorities are provided in the Appendix.

HEiDi

In November 2020, HEiDi expanded to include callers triaged as "Red" (i.e., see MD now) by the 811 Nurse. Since the "Red" expansion, HEiDi VP's provide an average of 117 consultations per day (service hours are currently 9:00am to 11:00pm). Significantly, ***HEiDi greatly exceeded the operational target of handling 20,000 calls in its first year – reaching over 30,000 calls***.

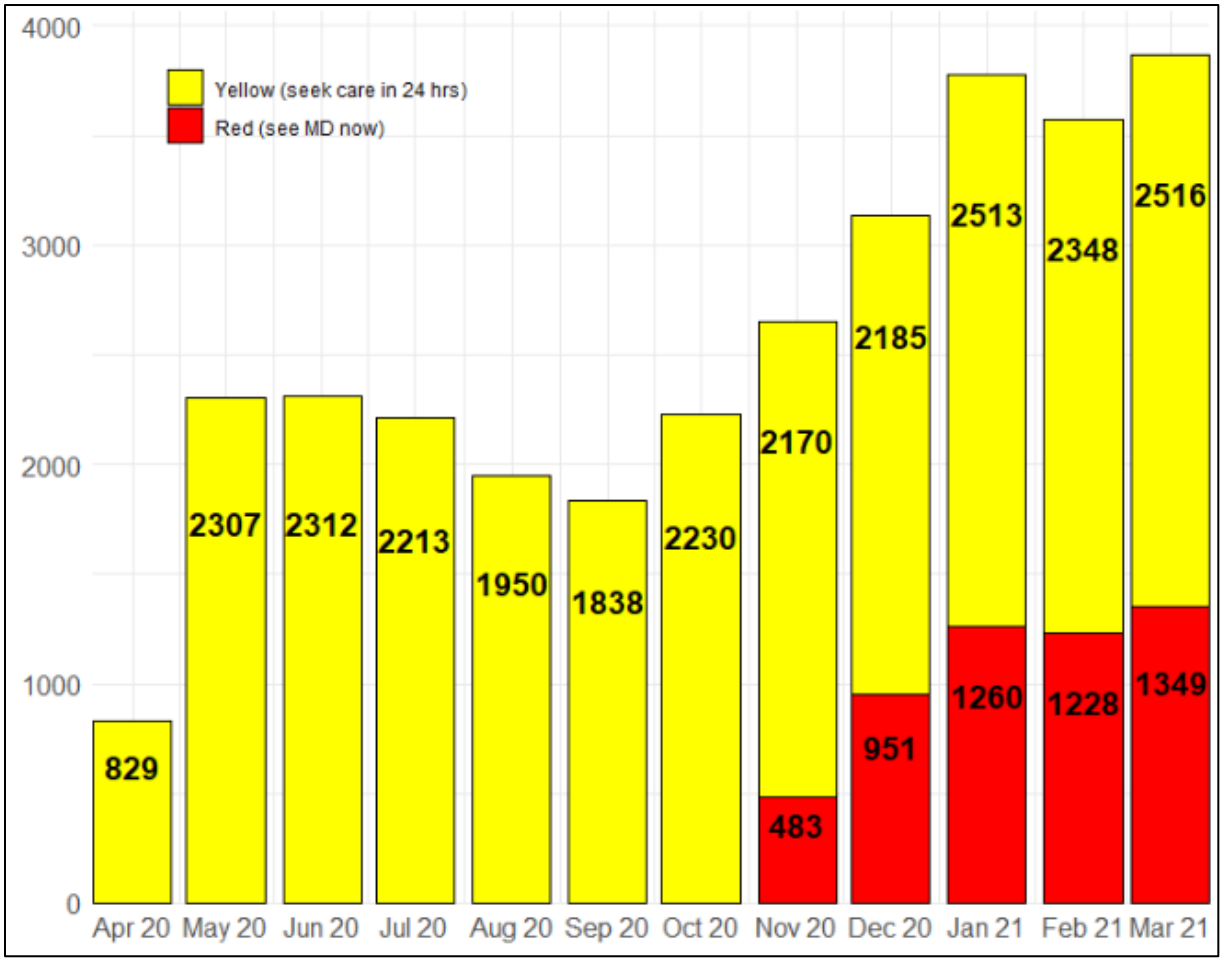


Figure 7: HEiDi monthly call volumes.

Approximately 17% of HEiDi callers indicate *not having a family physician or usual care provider*. Further, of those with a family physician, 53% of callers do not try to call them before contacting 811 and 53% are not able to reach their family physician if they do try – ***suggesting that HEiDi fills an important care and information gap for both attached and unattached citizens by providing timely, virtual access to a VP.***

Over 63% of HEiDi callers are female and 58% are in the 20-65 year age group; however, a sizable proportion of callers are over 65 years old (15%) or less than 5 years old (17%). Fraser Health Authority accounts for 36% of calls, with the Surrey Local Health Area having the highest number of calls. Notably though, Vancouver Island Health Authority has the highest number of calls per capita (794 per 100,000 residents), compared to Fraser (673, second highest) and Northern Health Authorities (647, lowest). HEiDi callers' primary health concerns are related to gastroenterology/digestive (18%), musculoskeletal (12%), dermatology (10%), or respiratory (10%) problems.

Approximately 75% of HEiDi callers are downgraded and advised by the VP to manage their health concern at home or to follow-up with their family physician in the next 7 days. Importantly, ***about 17% of callers are accelerated to their local ED*** for in-person assessment and care for their health concern.

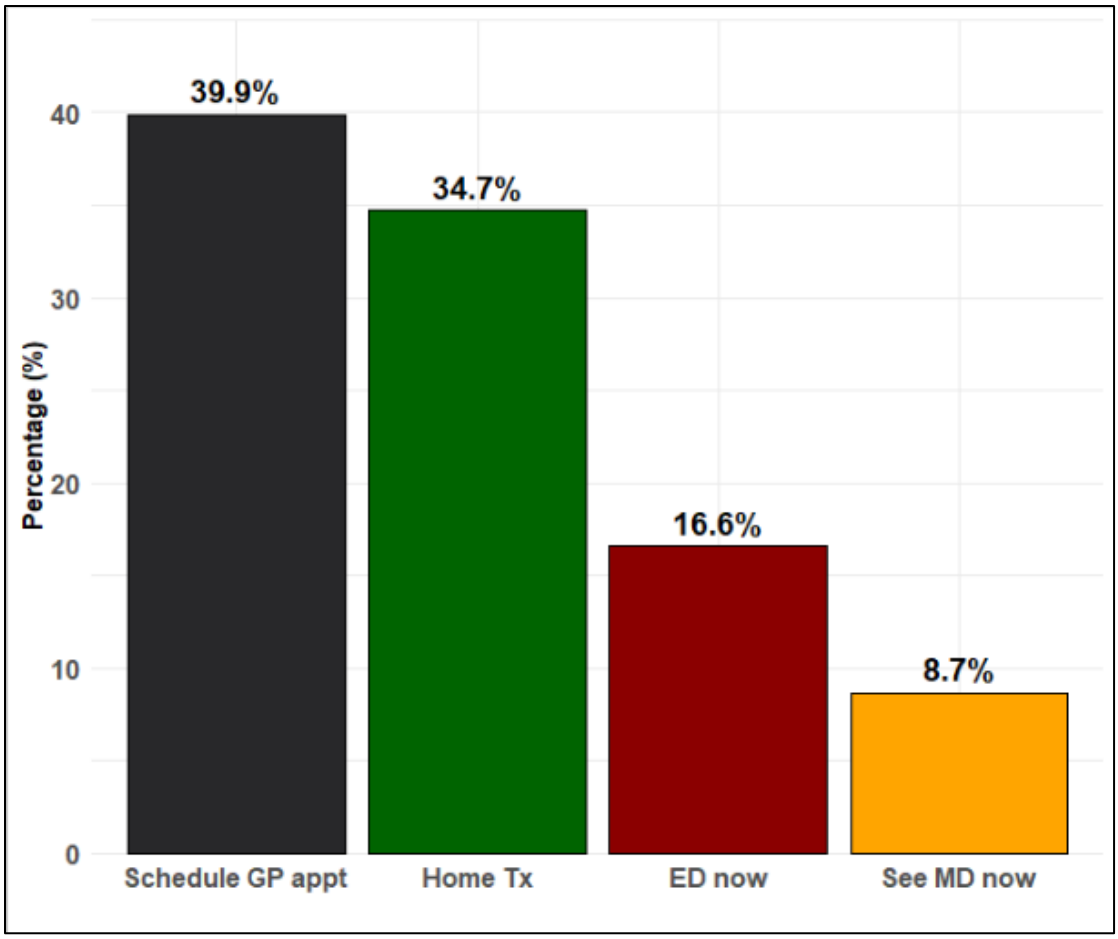


Figure 8: HEiDi post-consultation VP disposition.

Peer-to-Peer Pathways

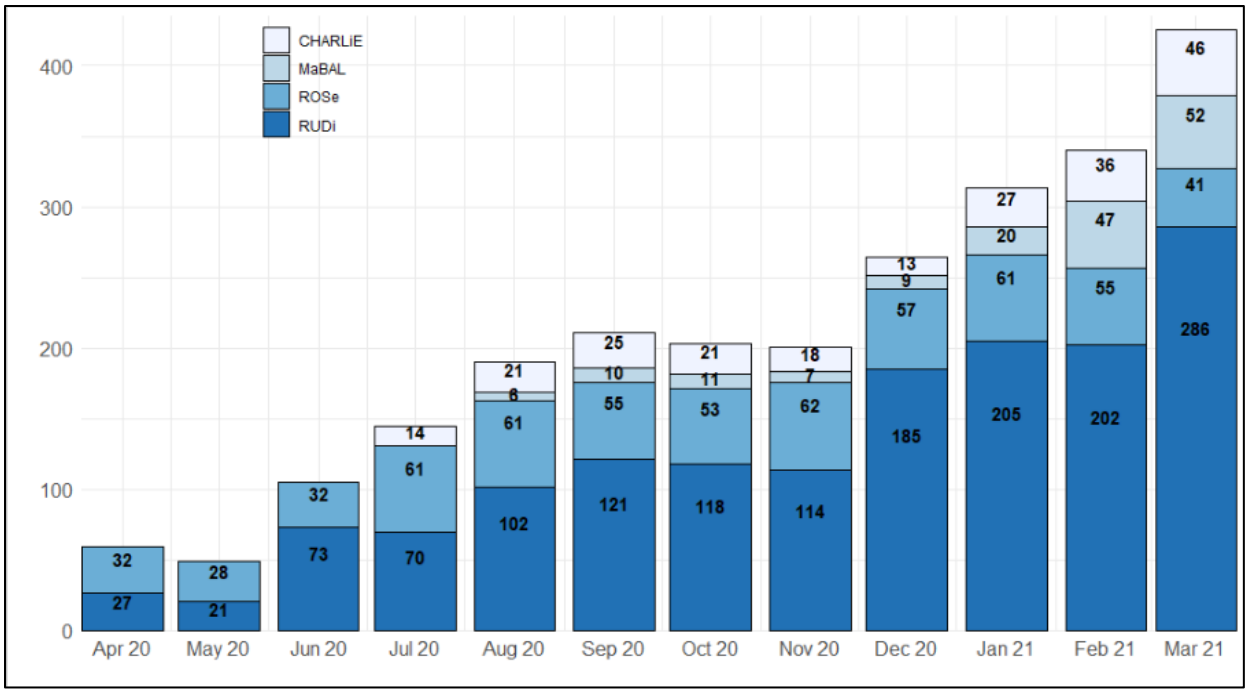


Figure 9: CHARLiE, MaBAL, ROSe, and RUDi monthly call volumes.

The four peer-to-peer pathways have received a total of 2,505 calls from community healthcare providers in the past year. Each pathway has seen tremendous growth as well, with a ***combined average of a 129% increase in calls*** from their first half of service to the second half (accounting for when each pathway launched). When collapsing across the four pathways, there has been a ***230% increase in calls overall*** from April-September 2020 (759 calls) compared to October 2020-March 2021 (1,746 calls).

VP's indicate about 6% of calls received are solely education-based, where they offer simulations or provide guidance to rural healthcare providers on different procedures and other clinical competencies. More significantly, VP's report that ***most clinical calls have an education component***, whereby directly assisting with the management of a patient can ***reinforce or improve the clinical skills and confidence of rural providers***.

Part of this call growth is due to RTVS uptake by ***new*** BC communities and part is due to ***high frequency utilization*** by a handful of communities. In Year 1, ***91 different BC communities*** accessed at least one of the RTVS peer-to-peer pathways for support. In the first six months of RTVS, 46 BC communities accessed RUDi, CHARLiE, or MaBAL. In the last six months, *45 new communities* accessed one of these pathways. Finally, we see that the top four communities accessing RTVS are FNHA remote health stations staffed by community health nurses: Lax

Kw'alaams (Port Simpson), 257 calls; Gitxaala (Kitkatla/Dolphin Island), 152 calls; Ulkatcho (Anahim Lake), 136 calls; Kwadacha (Fort Ware), 72 calls.

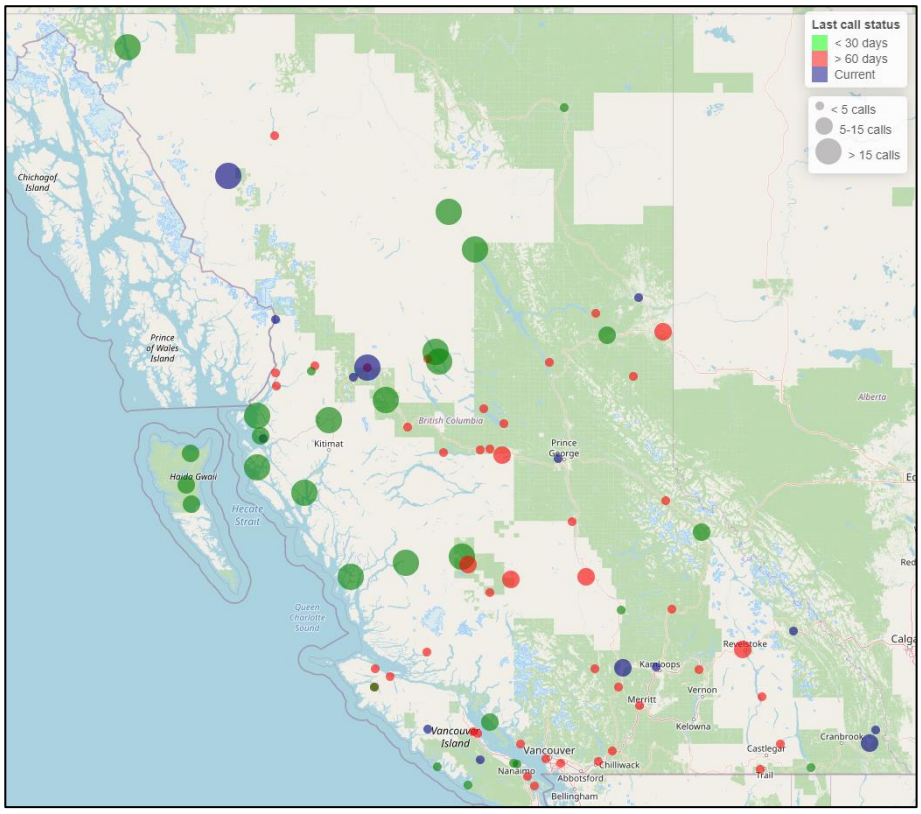


Figure 10: Map of the 91 BC communities accessing CHARLiE, MaBAL, and/or RUDi.

The peer-to-peer pathways have supported an extensive array of medical problems over the course of 1 year. A small sample of problems are presented below.

Table 4: Sample of medical problems supported by peer-to-peer pathways.

CHARLiE	MaBAL	ROSe	RUDi
• Head injury in 10 year old • Advising treatment for hemophilia/ hemarthrosis • Poor weight gain with infants • Status seizures • Epiglottitis • Neonate with fever and complex history	• Unplanned birth in remote community • Foreign body in ear • Postpartum thyroiditis • 35 week pregnancy with pre-eclampsia • Baby with ring worm and milk tooth • Inconsolable crying, night terrors • Newborn feeding and jaundice	• Cardiac arrests; "code blue" resuscitations • Chronic or non-chronic life-threatening issues • Intubation of COVID-19 patient	• Various fractures, head injuries • Resuscitation of asthmatic patient with possible PE • Second opinion on shortness of breath, pre-syncope, chest pain, abdominal pain • Substance use, psychosis, alcohol withdrawal

For ROSe VP's, anecdotal evidence indicates that they spend almost 60 minutes on each of their consultations as call volumes have grown. VP's for CHARLiE, MaBAL, and RUDi report an average call length of approximately 20 minutes, while noting that lengths vary tremendously based on the type of problem, origin of call, time of call, and other factors. For example, VP's may only spend 5-10 minutes providing a second opinion on straightforward cases (e.g., treating a broken toe). More complicated consultations may involve 30-60 minute calls so that the VP can provide guidance on a uncommon procedure, take the patient's history, review an ECG chart or ultrasound, or develop a full care plan with the calling provider that accounts for the limited resources of the setting. Almost all VP's noted a small handful of urgent, complex cases that they supported over the past year that required >1 hour of time. For instance, VP's described resuscitation cases at rural or remote health centres, where they supported the on-site nurse performing unfamiliar procedures in a stressful atmosphere. Or, cases where the VP has taken the role of Most Responsible Physician (MRP) and overseen the management of the patient while transport is arranged.

Related to the call lengths and case complexity described above, VP's have indicated that there has been a commensurate increase in the complexity of their shift work as call volumes have grown. One aspect of this is the need for VP's to utilize additional communication tools beyond receiving Zoom calls and charting in MOIS. In many cases during their shifts, VP's communicate with community nurses and physicians via Zoom chat, personal text messages, or email to receive updates on patients, share notes/charts, and order medications. Additionally, with the growing call volumes, peer-to-peer VP's are now receiving multiple calls simultaneously. This has been especially true for RUDi, where RUDi VP's may now act as MRP for two or more patients concurrently. This has also led to the implementation of an "overflow process" for each pathway, so that incoming calls to an already-engaged VP are automatically transferred to another peer-to-peer pathway (i.e., RUDi calls are re-directed to MaBAL).

Cost Factors

Preliminary Cost-Minimization Analysis of HEiDi

For HEiDi, we additionally conducted an economics analysis to determine the potential costs *minimized over one year* of service. The HEiDi service costed approximately $2,142,004 (VP's' wages, VMOAs' salaries, and office manager's salary). Based on 74% of patients being diverted by HEiDi from visiting the ED or UPCC, we estimated that **$4,745,632.31 in costs were avoided by the health system**, leading to a **net minimization of $2,603,628.31.** Additionally, for rural or remote patients that would otherwise face out-of-pocket costs to address their health concern (i.e., travel, accommodation), we estimate that these **patients avoided $7.9 million in societal costs**. See the Appendix for more details concerning this analysis.

Patient Experience of Virtual Care

> *"Thank you HealthLink BC for this outstanding service which I used for the first time last night. I'm a senior who lives alone and the guidance and reassurance [the doctor] gave was remarkable, as was the short wait time (~30 minutes). I will be sharing my positive experience of this new way to use health care dollars more effectively with my health care providers, family and friends." – HEiDi Caller*

Across all three patient-facing pathways, users self-reported a high rate of satisfaction following their virtual encounter. Over 90% of FNvDoD clients were satisfied with their consultation and over 95% would recommend the service to their family and friends. Similarly for HEiDi, about 94% of callers were satisfied with the service, with one minor albeit consistent complaint being the time spent waiting to speak to the VP was too long.

"I attended a call with my daughter yesterday and [the doctor] called us back right away. I have not felt that respected, supported and understood from anyone in the medical industry in a very long time. She made our difficult situation so much easier to deal with…We both cried from relief after we got off the phone because we were provided an easy to follow holistic plan and felt like we were heard. Thank you for this critical service for people who are not always treated kindly in this industry. It meant the world in our time of need." – FNvDoD Client

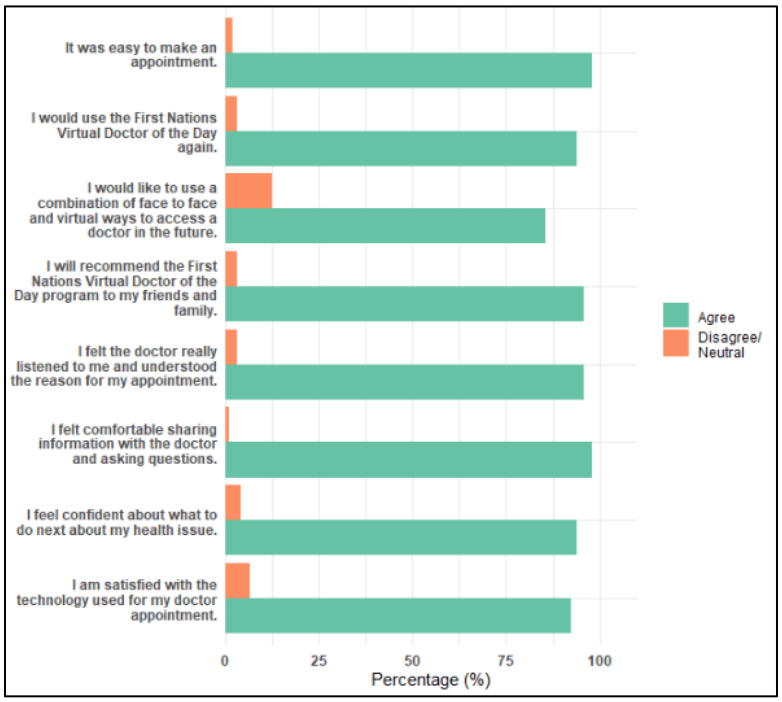


Figure 11: Survey ratings provided by FNvDoD clients following their encounter.

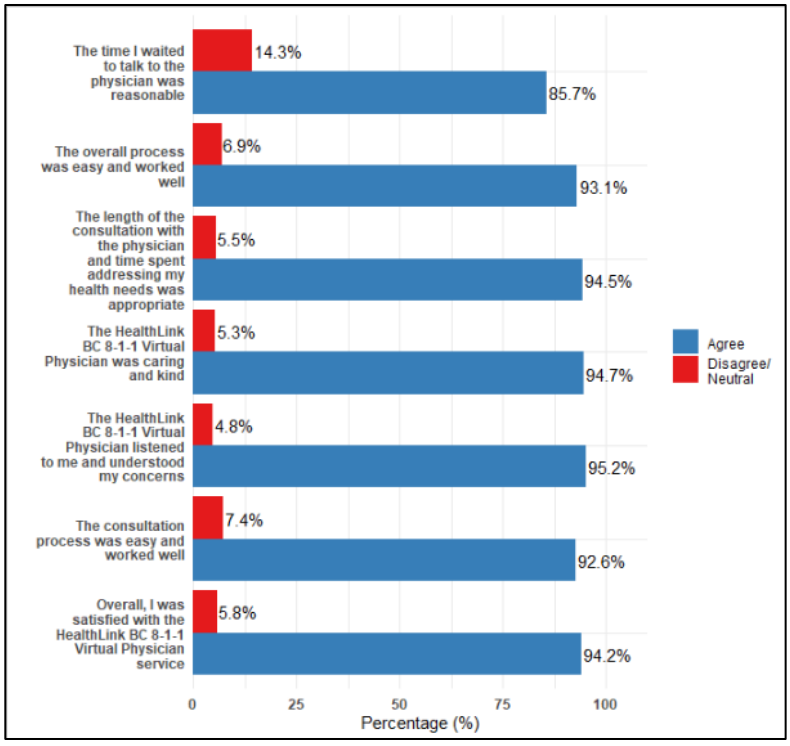


Figure 12: Survey ratings provided by HEiDi callers following their encounter.

Improving Access to Timely Care

"[RTVS] is a good bridge for patients. There can be 2-3 week waitlist for the doctor or we only have a doctor once a week. It's like another avenue for patients to call without having to wait so long." – Remote Community Nurse (accesses RUDi and ROSe)

Impact on patient health and outcomes also extended to the key themes of the ability to have access to care in a timely manner and ability to access care in their community of residence. VP's and end-users repeatedly discussed how RTVS was able to provide patients an additional avenue of care to which they did not previously have access. Impacts on care for Indigenous communities were commonly raised as well.

"The big success is being able to reach Indigenous communities and those really remote communities" – MaBAL VP

"It was super easy to make an appointment, I felt like the quality of my appointment was better than face to face experiences. My doctor was very thorough and approachable, down to earth. I am going to recommend this service and I hope funding will continue beyond COVID. 10/10 experience!" – FNvDoD Client

"*Instead of having to move a patient, the patient was able to stay in their own community*" – CHARLiE VP

"In the case of high-risk alcohol withdrawal management: developing a management plan in rural community where patient wanted to be, felt safe. Was a very satisfying case. RTVS is supporting rural physicians, who are vital to the health of the patient population in BC and elsewhere. RTVS is improving access to care for patients in BC." – RUDi VP

"Connecting to a virtual physician is an excellent idea and I hope it continues beyond COVID. I wasn't able to see my family doctor in a timely manner and needed to better understand how to handle my concussion. Speaking with the HEiDi VP was a discussion rather than a one-sided delivery of information. He helped me figure out a plan." – HEiDi Caller

Care in place (i.e., accessing care in their place of living) was also a major theme of the interviews. VP's expressed positive views and provided numerous examples on the impact of RTVS in providing care to patients in their communities. In the cases where patients needed to be transported to a larger health centre, VP's were able to arrange these transportations through RTVS while keeping the patients involved throughout.

"It is an avenue for patients to call and not have to wait so long" – RUDI End-User

"Instead of having to move a patient, the patient was able to stay in their own community" – CHARLiE VP

Experience of RTVS Providers Delivering Care/Support

"Beyond impressed with the logistics and constant attention to changing conditions. Clearly the right administrative people in the right positions. Great communication. And I enjoyed providing the care!" – HEiDi VP

A common sentiment continually expressed throughout discussion with VP's and end-users was that of providing support, building relationships and strengthening core competencies that lead to a community of practice. Rural and remote physicians really valued the support they were able to receive such that they felt safe and confident practicing in their communities. The ability to connect to colleagues when needed reduced the sense of loneliness and isolation in their practice.

Likewise, urban physicians were grateful to learn more about the unique challenges that face providers and patients in rural and remote communities.

> *"I felt a lot more confident and a lot more reassured knowing that there was a wrap-around team, even if they weren't there in person. If I needed help or support, particularly acute bedside help or support, then you know, when there is only one provider or two providers on the ground, being able to pick up the phone and call and have another team member available virtually, one or two team members. Whether that's MaBAL or CHARLiE or the other services, to help in whichever way I needed was incredible" – MaBAL VP*

These positive experiences have had an impact on how VP's and end-users view virtual care going forward as well. Still, users did highlight areas where the experience can improve. First, **inequities in technology availability** continue to exist across the province, particularly manifesting in broadband access leading to dropped calls or inability to use video. Related to the technology piece was the common request to streamline the different systems (e.g., EMR, Zoom, etc.) such that it is easier to manage the different technology platforms and their login information. A desire for a **more equitable compensation models** across the pathways such that VP's feel that they are being adequately remunerated for their work. New directions for the pathways included medical education, mental health and addictions support, wound and device management, and further clinical extensions into areas such as obstetrics.

> *"Yes, absolutely. In the past, I did not think [virtual care] would work and now I see that it does. And I know it's been a long time getting to this point so actually in the beginning I think it didn't work but they've got a system now that works and in fact now I teach ultrasound virtually as well" – MaBAL/RUDi VP*

While a small number of VP end of year survey respondents identified some areas of dissatisfaction within their RTVS work, the majority of VP's indicated that they were satisfied with different aspects of their work and believed that RTVS positively impacted patients and/or rural providers. 94% of VP's reported that they were satisfied with their experiences working on RTVS and enjoyed delivering care/support virtually.

> *"Having experienced physicians providing expert real-time support for all the nursing stations, for all the rural docs is something critical to help all these new physicians coming out of practice and going to the middle of nowhere. I think [RTVS] will improve the ability of rural BC to recruit and retain physicians as these new doctors will finally be supported to do a good job despite still being a bit 'green'."* – RUDi VP

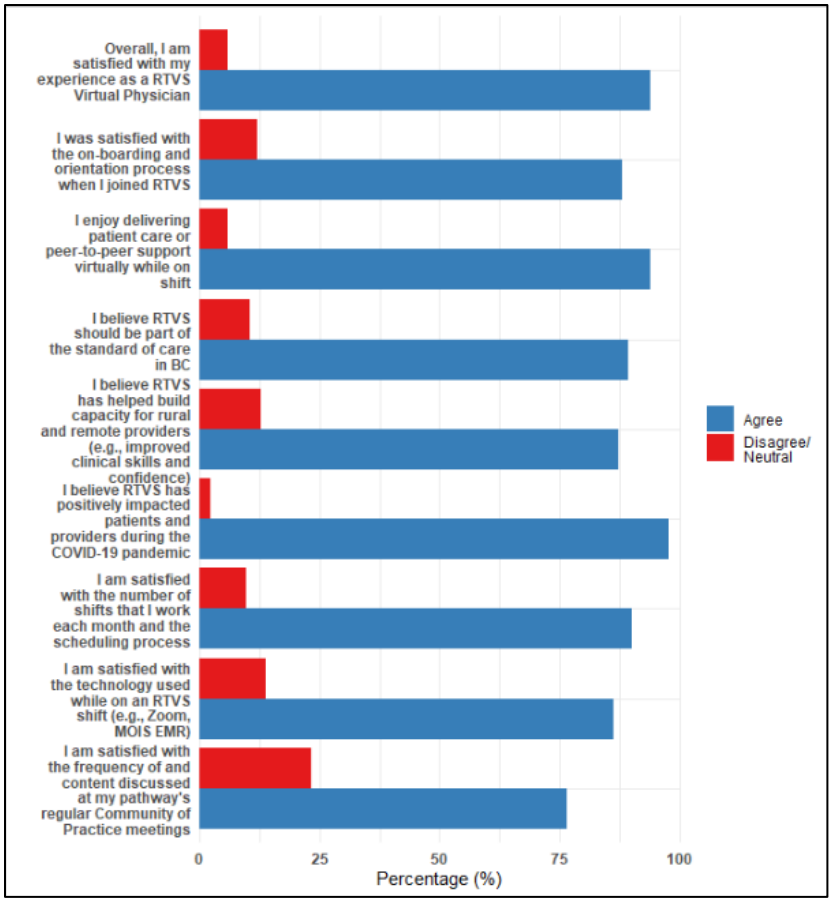


Figure 13: Summary of responses from Year 1 VP survey.

Critical VP Qualities & Skills

One important factor to successfully building positive, long-term relationships with community providers is ensuring that VP's always demonstrate core attributes, and model the "call a friend" approach. An RTVS needs assessment survey of rural community providers conducted by UBC CPD included an RTVS evaluation question, namely what are the most important qualities that an RTVS consultant should possess. Understanding of the challenges faced practicing in low-resource settings along with clinical expertise were rated most highly, with kindness, empathy and listening skills.

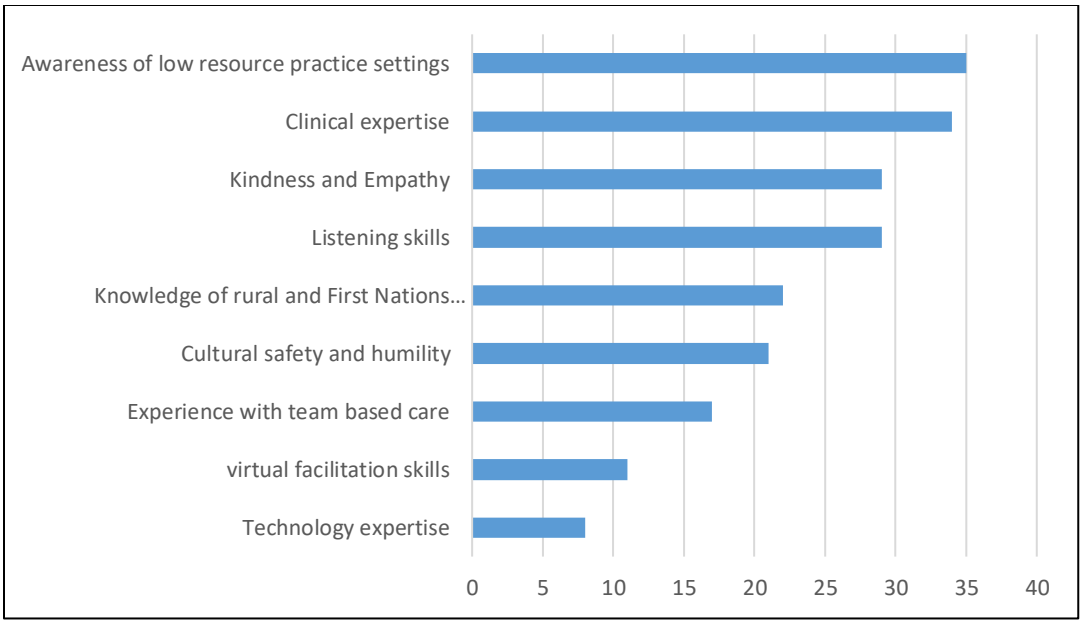


Figure 14: Most important qualities of peer-to-peer VP

Interviews with end-users characterized the ideal VP as having a balance of knowledge (clinical and about rural practice) and soft skills (e.g., empathy and kindness).

> *"It has provided an opportunity to develop a community to support practitioners in rural and remote communities, but as an urban specialist practitioner it has helped me to understand challenges faced by patients and practitioners in rural areas and I hope to respond these more effectively." – CHARLiE VP*

Supporting Community Healthcare Providers: Multi-Dimensional Benefits

> *"I can't express enough how grateful I am as a relatively new practice physician in rural BC to have RUDi, ROSe, CHARLiE and all the lines and tools that have been rolled out….Very quickly these supports have been very integrated to how I practice in the clinic and Emergency. Access to these services in the nick of time has changed outcomes." – Rural GP (accesses peer-to-peer pathways)*

The four RTVS peer-to-peer pathways have had a significant, positive impact on healthcare practitioners serving in rural, remote, and First Nations communities in BC. The different levels and types of collegial support provided by these pathways **directly build capacity** for community providers accessing RTVS. Interviews, meetings, and informal feedback from these RTVS end-users indicates **multi-dimensional benefits**.

Strengthening Relationships, Improving Well-Being

By demonstrating a non-judgmental, "call a friend" attitude, RTVS VP's are building relationships with new rural/remote healthcare providers and ensuring that end-users are encouraged to access

RTVS whenever they need support. Bringing the "friend in the hallway" type of support typically seen in urban care settings to the rural environment means that physically isolated providers can still access compassionate collegial support on-demand for minor or complex cases.

> *"The VP's listen, they are empathetic, they value our experience and what we are seeing" – Remote Community Nurse (accesses RUDi)*

RTVS end-users report that this type of conscious relationship building by the peer-to-peer pathways has **improved their psychological well-being**. For example, rural/remote physicians and nurses state that their **sense of professional isolation** and **anxieties in practicing in low-resource settings** have improved with RTVS availability.

> *"The VP's understand the context, cultural safety, without having to explain the reality of what you're doing or where you are" – FNHA Remote Community Nurse (accesses RUDi)*

Continuing Education, Improving Clinical Competencies

Beyond providing compassionate support, RTVS supports ongoing education of rural physicians and nurses at multiple levels. On a call-by-call basis, VP's note that many patient consultations involve some educational opportunities for the provider, whether it is further guidance on an unfamiliar procedure or reiterating updated clinical guidelines. RTVS is also able to **mentor** new medical residents or international physicians serving in rural BC communities. Finally, emblematic of the **Fire Department metaphor**, RTVS has provided concentrated, non-clinical education opportunities over the past year. These have included several formal **simulations** with various rural/remote healthcare facilities, where RTVS VP's from one or more pathways virtually support patient care and clinical procedures being performed by on-site staff.

> *"As a new-to-practice family doctor who's often working in remote communities where I'm the only physician, being able to call in for support and help with assessment and management has been invaluable. When I encounter novel and stressful situations, I can call for immediate help. I have used the RUDi line in particular on multiple occasions and it has made a difference in patient care. Today I was able to avoid transferring a patient out of the community with their help. I feel confident practicing in these remote settings knowing I have highly capable, readily available support in my back pocket who can understand the low resource context I'm working in. I'm also involved in a new rural virtual simulation project, and we will be working with RTVS/RUDi to help facilitate our simulations and give feedback to rural providers to help us keep learning and developing our medical knowledge and skills. I cannot imagine practicing in rural and remote BC without the RTVS pathways." – New-to-practice Physician (accesses RUDi primarily)*

Together, these educational supports have **increased the clinical confidence and competencies** of the rural/remote nurses and physicians accessing RTVS. Further, the 24/7 on-demand availability and high accessibility of the peer-to-peer pathways facilitates **interdisciplinary, team-based care** in rural and remote settings, thus, addressing long-standing healthcare inequities

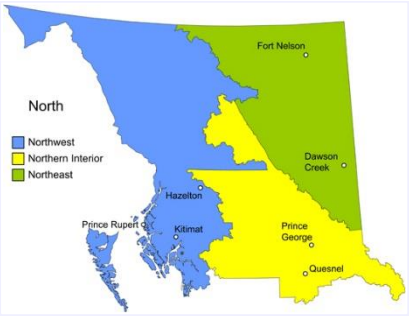
faced by rural, remote, and First Nations patients. Our evaluation thus far also suggests that RTVS is **improving the recruitment and retention** of rural providers. However, further work and time are needed to fully elucidate RTVS's impact. Finally, the successes of the non-clinical, educational activities of RTVS in the past year have led to a **funded, regularized Fire Department initiative**. This Fire Department initiative will be able to formally engage more VP's in non-clinical, paid activities (e.g., community outreach, further relationship building, conducting simulations). Its activities will continue to **build local capacity** by ensuring that the peer-to-peer pathways are accessed frequently, that simulations meet the expectations of participants, and that community providers' clinical skills are improving over time.

Facilitating Patient Transport

Over the past year, transport has become an increasingly important element of consultations for the peer-to-peer pathways. RUDi, CHARLiE, and MaBAL VP's report that about 19% (8% for MaBAL to 26% for RUDi) of their shifts involve a case with *explicit* transport considerations. "Facilitating patient transport" involves different facets, including whether RTVS is *accelerating* or *delaying* transport or whether RTVS *avoids* transport when clinically unwarranted. Our analysis thus far suggests that RTVS providers are successfully supporting "patient-centred care plans involving transport" in several dimensions, such as supporting nurses preparing patients for med-evac, directly speaking with patients or family members by video to communicate the care plan, or contacting the Patient Transport Network (PTN) or Emergency Physician On-Line Support (EPOS) to coordinate on the nurse's behalf. However, we are limited from drawing more fulsome conclusions about RTVS impact on transport and future analyses will seek to validate these outcomes by drawing on administrative data sources.

In a broader sense elucidated through interviews, transport is an *implicit* factor in most calls, especially for community nurses at remote stations that contact RUDi for generalist problems. In these cases, the nurses are providing primary care to patients in their community. When these cases need a physician's order (e.g., for antibiotics) or additional support around management or decision-making, RTVS VP's are readily available to assist. With a RTVS physician on-call 24/7, nurses are able to continue in-person care of their patients, thereby ensuring that patients are able to stay within their community for many of their primary care needs.

Transport Case Comparison: A tale of two RUDi transport cases in Northern BC



<u>Context:</u> Prince George is a major referral centre for many communities in Northern BC when patients require specialized, in-person assessment or care. Prince George can be reached in 1-2 hours by plane, weather permitting, or anywhere from 6-12 hours by car/ambulance, given the variability of local road conditions.

Case 1: Streamlining the transport and referral process.
A middle-aged man presented at a remote First Nations health centre with "worrisome" chest complaints. The on-site nurse practitioner quickly contacted the on-call RUDi VP. The RUDi VP supported the nurse's assessment that the patient needed further care in Prince George. While preparing the patient, the RUDi VP contacted PTN to arrange transport by plane, then contacted the referral centre to notify them of the patient's arrival. The patient was on the plane within 1 hour and subsequently treated in Prince George.

Case 2: The care team finds the "best compromise" for a tough overnight case.
Late at night, a patient presented at a remote nursing station with an urgent urologic condition. The nurse first contacted the on-call physician at the nearest regional hospital. The nurse and physician tried to contact the regional urologist for further support, but were unable to reach them. They then determined that the patient required immediate transport to Prince George. However, PTN was unable to med-evac the patient due to poor weather conditions. As a next option, the EPOS physician would travel by ambulance to the community – an estimated 4-hour round-trip – then the patient would be transported by road to Prince George – an additional 6-7 hour journey. While the EPOS physician was enroute, the nurse contacted the RUDi VP for interim management of the patient. The RUDi VP supported the nurse and patient for approximately 3.5 hours overnight until the other physician arrived, also connecting to another urologist for additional consultation. The RUDi VP described this as a memorable but very "tough" case, where an interdisciplinary care team worked collaboratively to develop the best care plan given suboptimal conditions.

Supporting Rural & Remote Communities

As RTVS builds capacity for rural and remote healthcare providers, this translates to direct benefits for the communities and patients that they serve. As one VP stated: "Rural providers are vital to the health of the patient population in BC." With four different RTVS providers available 24/7, patients in rural, remote, and Indigenous communities now have enhanced care options and improved access to physicians.

"RTVS certainly has a hand in enhancing rural equity. The big success is being able to reach Indigenous communities and those really remote communities." – MaBAL VP

"Thank you for making this service available to our vulnerable communities. Even not having a call still makes me feel we are creating a <u>safety net</u> for our colleagues working in challenging environments." – RUDi VP

Community Case Study: RTVS is a game changer for Atlin

Context: Atlin is a remote community in northwestern BC, 200km from the Yukon border. There are 500 year-round residents. Patient referrals initially go to Whitehorse, which end up being referred back to BC – revealing challenges with inter-territorial/-provincial collaboration amongst rural providers and regional referral centres.

Excerpt: Experience from a Nurse in Atlin, BC – in her own words

Atlin is pretty unique in its setting. Before RTVS we had gone for a period of 6 or 7 months, because of the pandemic, that we hadn't had a doctor visit at all. We see patients for routine care and we also provide emergency services. Nursing challenges here have been the lack of access to higher level care. RTVS gives that back up – the ability to have eyes on the patient. It gives that comfort level. There was a sense of relief after that first conversation with Dr. John! We kept poking ourselves - is this real? First Nations Virtual Doctor of the Day will be a great resource for the people here. We love it and it's a game changer for us, all our interactions have been very positive.

[With RUDi] I know I'm not [transporting the patient out] just because I'm afraid of missing something but with some valid reason that's backed up. When I first started doing this, I wanted to send everyone to Whitehorse because "what if I miss something?" But then I realized people…. want us to be dealing with things here. So trying to find that line of what can we manage here and what we need to manage elsewhere. Increasing the confidence in what we can do here….

We are able to provide better service to clients and support us in our practice so we are more likely to stay in this line of work. Supporting the longevity of our careers and recruitment and retention in these areas.

It's been well received by the clients. At first you can see they're a little skeptical but once they see how quickly they get results, this is fantastic. It's not exactly like having a physical being in the room with you but it's been great. I think that combination of having us here to be the hands, it really fosters that team approach. [The virtual physicians] listen. They are empathetic. They value our experience and what we are seeing. They communicate well with us. They obviously care about and value what we are doing. We feel valued as well.

We keep using the word game changer when we talk about this program. The comfort level it provides ….how do you put that into words….how do you place a value on that? It makes it so much less stressful dealing with some of the situations. When we come in after hours, and you're alone and you're thinking "what if I can't get a hold of Whitehorse? What if I'm making the wrong decision here? It just provides such a level of comfort – it is fantastic.

Broadband infrastructure inequities for rural, remote, and Indigenous communities. Recognizing that internet access is now essential for equitable healthcare delivery: "Getting Wi-Fi into these communities is one of the biggest challenges, but really needs to happen."

Cross-Pathway Collaboration

At the end of Year 1, about **175 Virtual Physicians** currently worked on the seven RTVS pathways included in this evaluation (also accounting for a small number of VP's working on *multiple* pathways).

Table 5: Number of RTVS VPs on each pathway.

FNvDoD	FNvSUPS	HEiDi	CHARLiE	MaBAL	ROSe	RUDi
36	17	70	14	18	7	28

Over the past year, our evaluation has been able to document a significant growth in the *depth and quality* of cross-pathway collaboration in RTVS. Part of this is due to natural downstream effects as RTVS pathways have expanded (i.e., the development and implementation of CHARLiE, MaBAL, and FNvSUPS and the recruitment of more healthcare practitioners from other disciplines) and the call volumes have increased. As mentioned above, the latter has led to increased call and overall shift complexity, leading to RTVS Virtual Physicians reaching out to their colleagues for support. However, a direct driver of growing cross-pathway collaboration is the careful recruitment of new Virtual Physicians that embody the empathy, "rural resourcefulness", and team-player attitude of RTVS. Along with this, RTVS leaders have consciously cultivated strong, supportive Communities of Practice for each pathway, which fosters interdisciplinary relationships and knowledge transfer. The "call a friend" mentality is clearly modelled within RTVS. Thus, RTVS is continuing to enable a ***culture change*** in BC's healthcare system by transforming the perspectives of not only healthcare providers but patients, health administrators, and policymakers and increasing receptivity to the practice of virtual care.

> *"This call was in collaboration with RUDi as the nurse in Port Simpson called RUDi first but then due to the young age of the patient the RUDi doc linked me in via Zoom/ RTVs. The nurse in Port Simpson was using phone as she didn't have access to Wi-Fi." – CHARLiE VP*

Based on responses from RUDi, MaBAL, and CHARLiE VP's on their post-shift form, we can estimate the number of shifts where they connected to another pathway or service. We see that RUDi most frequently contacts the BC Emergency Health Services (BC EHS)/Patient Transfer Network to coordinate transport of patients. RUDi and MaBAL VP's also connect frequently, with each pathway reaching out to the other for support. We also observe that CHARLiE VP's commonly contact their CHARLiE colleagues for consultation support. VP's also indicate that they connect directly with the RTVS Dermatology line, COMPASS, addictions helplines, and community coroners infrequently on a case-by-case basis.

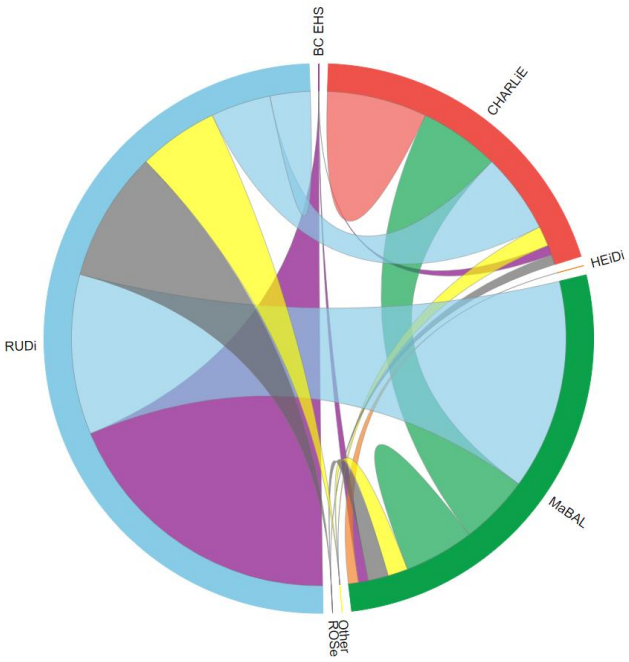


Figure 15: Diagram of Cross-Pathway RTVS Connections.*

Numbers correspond to band width in figure		TO						
		BC EHS / PTN	**CHARLiE**	**HEiDi**	**MaBAL**	**Other**	**ROSe**	**RUDi**
FROM	**CHARLiE**	0	9	0	8	1	1	6
	MaBAL	0	7	1	7	2	2	12
	RUDi	13	4	0	8	5	7	3
**Only from shifts since December 18, 2020.*								

Case Study: RTVS facilitates team-based care to achieve a community "first"

Context: A remote First Nations community of 1,600 people had not had an in-community birth in 20 years. A pregnant woman was reluctant to leave the community, so her local healthcare provider reached out to RTVS.

Interprofessional collaboration involved MaBAL and CHARLiE in preparation and set up for a birth in a small community. With team effort, they were able to bridge maternity and neonatal pediatric side from the health authority, FNHA, and the two pathways. Midwife worked with the nurse in the community, with no cell service and only Wi-Fi and spoke to other providers via zoom call.

We "went from having 4 hands to 8 hands." The most rewarding was working with an interdisciplinary team, seeing them come together with core values of the service. This also bridges health system development and leadership to the frontline clinical side, and "mobilizes resources and knowledge translation in ways that can tangibly meet the needs on the ground."

Discussion

In the past year (April 1, 2020 through March 31, 2021), the seven RTVS pathways provided over 36,000 direct patient/client encounters, handled 2,250 calls from rural, remote, and Indigenous community healthcare providers, and offered 29,000 hours of peer-to-peer support. RTVS interview data with end-users, virtual physicians, and stakeholders have indicated several benefits, including improved accessibility of care for rural communities, reductions in out-of-pocket patient costs, and an increase in opportunities for mentorship, collaboration, and knowledge transfer between healthcare providers.[ii]

An important consideration for readers is that many aspects, themes, and impacts of RTVS are interrelated and crosscutting. In our Findings above, we have presented various outcomes as distinct (i.e., specific to transport but not cross-pathway collaboration). However, we recognize that these distinctions may be somewhat arbitrary. In this section, we will further contextualize findings to help illuminate the full complexity of RTVS.

RTVS demonstrated that it is a flexible, responsive suite of virtual services, with new specialist pathways (CHARLiE, MaBAL, FNvSUPS) rapidly launching in July-August 2020 to meet demand from rural providers and Indigenous citizens, while HEiDi underwent multiple "sprints" and expansions to connect more 811 callers to VP's. ***This growth has helped improve equitable access to care for patients across BC***. We observed consistently high satisfaction ratings from patients/clients accessing the 3 patient-facing pathways, with comments reiterating how these pathways serve as necessary "safety nets" during the COVID-19 pandemic. The growth and satisfaction seen with FNvDoD demonstrates the value of providing culturally safe care specific to Indigenous communities in remote regions and low-resources settings. CHARLiE and MaBAL have increased access to dedicated, specialized care specifically for rural pediatric patients and expecting mothers, who now may be able to avoid unwanted and unnecessary travel out of their local communities.

RTVS VP's expressed a high degree of satisfaction with their work and enjoyed providing care virtually. VP's appreciated the benefits that RTVS can provide to patients, including improved access to rural, remote and Indigenous patients, culturally safe care in place, avoiding unnecessary travel, reduced patient costs, and facilitating patient-centred care through collaboration and coordination of different care providers.

[ii] See Appendix for a collection of participant feedback.

RTVS also resulted in benefits for community healthcare providers, such as increased of confidence of providers working in rural and remote areas, relationship-building that fosters community of practice, knowledge transfer and continued learning opportunities, mentoring opportunities, fostering culture change in how medical care is provided, and the ability to manage a variety of cases and provide a range of support. Based on their feedback, for VP's the keys to success for providing virtual care through RTVS then are about fostering strong relationship and partnerships through shared goals, recognizing and embracing diversity, kindness, empathy, willingness to learn, flexibility, openness and being available.

> *"This patient presented with an overdose leading to cardiac arrest. The patient likely would have died had I not been able to support the local physicians through resuscitation. The patient survived and was able to be transported to a larger center by day 2 for further follow-ups." – ROSe VP*

Limitations

In our evaluation of RTVS over the past year, we have sought to collect robust data to support Quality Improvement efforts and evidence-based learnings of virtual care in BC. However, we note here several weaknesses in our methodology and where we are limited in drawing stronger conclusions. For example, our evaluation of caller outcomes for HEiDi suggested that VP's could divert 75% of callers away from in-person urgent care, while 17% were advised to visit their local ED within 1 hour. Yet, while 98% of callers report that they *intend* to follow the VP's disposition, we are unable to verify callers' post-encounter health system utilization. Our next phase of evaluation will include linkages to provincial administrative databases in order to determine if callers adhere to VP's advice to attend the ED or visit their family physician.

Further, our quantitative evaluation of the RTVS peer-to-peer pathways has primarily relied on data collected by VP's and recorded in a post-shift form. Though these data are rich in terms of case details, we acknowledge that a small number of calls may be missed or mischaracterized, while also burdening VP's by asking them to duplicate some information already in the MOIS shared EMR. Our future evaluation will seek to utilize more robust reporting and tracking methods and leverage mechanisms now in place.

Current Challenges & Opportunities

Existing **infrastructural inequities** across the province still remain a barrier to providing equitable care. Bandwidth limitations continue to be experienced during calls leading to VP's using other modalities of communication with 17% of VP's saying they had significant connectivity issues and 29% expressing that connectivity was "fast but unreliable." As one VP put it, "the technology shouldn't matter. It should exist in the background to facilitate the call reliably". With this in mind, ***a multi-modal approach that uses the most reliable communication method for the area***

requesting assisting would help address these inequities in infrastructure in the short-term. Continued advocacy is needed to ensure that reliable, equitable solutions are implemented for the long-term.

Relevant to this evaluation, we learned that the community of Lax Kw'alaams (Port Simpson), a First Nations village of 3,800 people near Prince Rupert, had improved its broadband connectivity over the past year, at least in part due to the advocacy of RTVS members. We sought to interview community members and providers to capture a "before-and-after" case study of how improved broadband connectivity had impacted the accessibility of RTVS and other outcomes. We were unable to do so for this report and acknowledge that these valuable insights are missing here, however, this will be a priority for our ongoing evaluation to document such an important and relevant case study.

Lack of awareness of RTVS pathways was also a barrier to providing virtual care. In some cases, on-site staff were unaware of RUDi or ROSe existing, or that dedicated pediatrics and maternity lines were available. This, in turn, led to some hesitation to use the pathways, with a common sentiment being that on-site staff "did not want to bother the VP" on the other end. Increasing awareness and access to these pathways across the province is a key growth area that will break down these barriers and hesitations.

Concern was expressed that the pathways are still too physician-centric. For a true patient-centred approach other disciplines within a patients circle of care need to be integrated further. Additionally, increased integration and coordination between the VP's and on-site staff was seen as a needed evolution for the pathways. Evolving the pathways into new clinical areas is also a growth area that can further foster the patient-centred care approach to virtual care. Common clinical growth areas mentioned by VPs were mental health and addiction support, wound management support and device management support.

Embedding RTVS virtual care pathways into medical education curricula was repeatedly mentioned as critical step to grow the service. This step would lead to increased awareness that virtual care is a viable option in the province, but also can be used as a tool for recruiting and retaining physicians in remote and rural regions. By embedding into the education curriculum, RTVS can truly become integrated into the healthcare system at the ground floor.

Ongoing Reporting: Evaluation Dashboard

To continue supporting RTVS Quality Improvement efforts and dissemination/communication of evaluation findings, we have created an Evaluation Dashboard. This multipurpose, interactive dashboard highlights key findings from the 7 RTVS pathways, with weekly refreshes drawing on data sources such as VP post-shift forms, HLBC call volumes, and ongoing key informant interviews. It is complementary to our quarterly/bi-annual reports. Users are quickly able to gather

high-level summaries of current RTVS metrics, pull screenshots for their own reporting, and leave feedback on existing or desired features via an embedded form. The Evaluation Dashboard will continue to be developed to meet users' needs and made publicly available in the near-term.

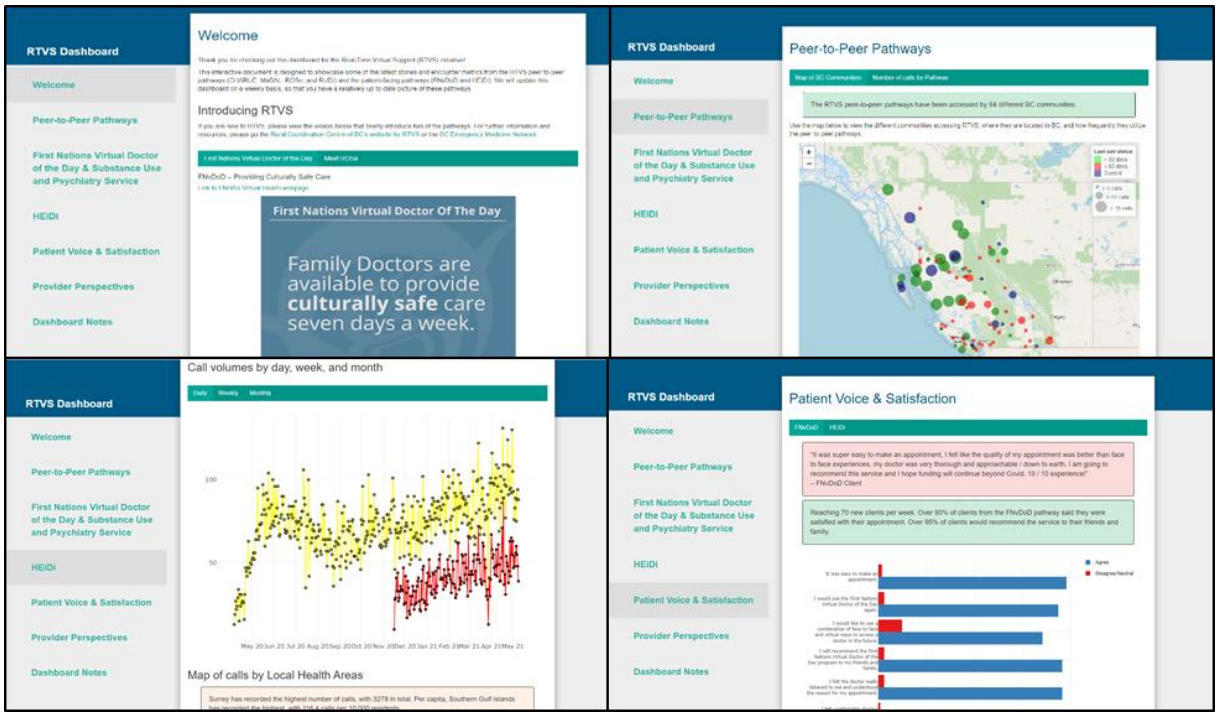


Figure 16: Screenshots of the RTVS dashboard.
Clockwise from top-left: Welcome/landing page; Map of communities; HEiDi daily call volumes; FNvDoD client survey responses.

Year 1 Recommendations

Our evaluation of RTVS over its first year has yielded concrete recommendations across six different areas. These recommendations are firmly based on evidence and analysis over the past year and are presented here to highlight specific ways that RTVS can continue to grow and positively impact rural, remote, and First Nations patients and providers in BC. Each recommendation is listed in the following along with examples and suggested strategies documented through stakeholder discussion.

Service Delivery and Practice

1. **Increase integration of RTVS to complement, strengthen, and sustain existing community health services (e.g., brick-and-mortar situated care).**
    - Use RTVS to foster system integration and cohesion through continued collaboration and partnerships.

- Immediate: improving links to community ED's, primary care teams, GPs, UPCCs in communities, and BC EHS (PTN).
- Longer-term: improving links to broader services, specialist care options.

2. **Continue to develop pathways to address emergent needs and current care gaps to continue reducing service inequities.**
   - Dedicated lines for (overnight) rural mental health care.
   - Taking first calls for over-burdened communities (e.g., Pediatrics in Terrace).
   - Hematology quick reply line.

Rural Education, Confidence, and Competency

3. **Embed educational activities as a key component of the peer-to-peer pathways to increase rural capacity and knowledge exchange.**
   - Informal test calls, planned simulations, continuing professional development initiatives (e.g., POCUS), have been regularized into ongoing programming, communities of practice, and the Fire Department initiative.

4. **Formally embed RTVS into medical education and training to empower emerging health professionals, foster bidirectional learning, and normalize virtual care.**
   - Work with educational partners and accreditation bodies to promote awareness of and engagement in RTVS to serve provider end-users and to build capacity for RTVS delivery embedding.
   - Support new to practice and other vulnerable providers to practice in rural, remote, and Indigenous communities through use and engagement with RTVS.

Culturally Safe Practice

5. **Model culturally safe care in virtual spaces through recruiting virtual practitioners that embody cultural humility and supporting ongoing cultural competency training and professional development.**
   - Incorporate cultural competency training in ongoing learning approach and faculty development (including Fire Department initiative for ongoing professional mentorship and support).
   - Build cultural competency as life-long learning supported by RTVS Fire Department initiative, communities of practice, and other avenues.

6. **Support the current work incorporating traditional practice into the virtual space for fulsome team-based care.**
   - For other pathways, draw upon the practice and collaboration with FNHA partners to connect patients, families, and providers to these pathways.

- Share, model, and promote awareness of traditional practitioners as key members of care team and vital to team-based care.

7. **Incorporate patient and end-user experiential approaches in evaluation and share formative feedback with RTVS providers.**
   - Foreground narrative approaches to rigorously document stories of human experiences of community members, patients, providers and others to foster perspective-taking, enhance communication and understanding, and address issues of power and inequity.
   - Actively share positive and negative feedback from patients so that RTVS providers are able to adjust their practice as needed.

> *"FNHA picked a group of physicians that have cultural safety skills and a collaborative spirit" – FNvDoD Virtual Physician*

Culture Change

8. **Model "call a friend" mentality at all levels of practice to lower threshold to access support.**
   - Model consistent messaging and service via a non-judgmental, collaborative, and service-oriented approach.
   - Hiring VPs with qualities and "soft-skills" such as communication and empathy, inclusion in hiring protocols.
   - Providing modeling, mentorship, and learning opportunities through reflection in communities of practice.

9. **Promote benefits of RTVS to new communities/providers to raise awareness and promote usage.**
   - Formalizing communications strategy and Fire Department work.

10. **Advocate for ways to strengthen rural resilience/resourcefulness to deliver care to patients in these communities.**
    - Short-term: continuing to be flexible with technology to maintain low barriers of access.
    - Long-term: advocating for equitable broadband connectivity in rural and First Nations communities.

Health System Change

11. **Continue to advocate for solutions that address structural inequities, including the digital divide.**
    - While advances have been made in broadband connectivity, this and other infrastructural challenges must be fully addressed for all people in BC to reap the benefits of person-centred longitudinal care.

"Rural resourcefulness, resilience, and collaborative practice can inform the wider system"

12. **Implement and iteratively assess shared technology platforms to broaden connectivity and facilitate scale-up.**
    - Shared platforms such as EMR to promote information continuity are a backbone of collaborative team-based care across settings.
    - Ongoing QI allows for tools to be responsive to evolving needs.

13. **Embed virtual care options into primary, team-based care services to make available virtual team practices anywhere in the province.**
    - RTVS and virtual care options promote patient-centeredness, provide opportunities for continuity through information sharing, and maximize patients' ability to access care closer to home.

"RTVS can stop physicians from working in little bubbles and bridge the gap between communities and patients and provide patient-centred care"

14. **Apply complementary, well-aligned compensation models for non-traditional service delivery models to promote sustainability.**
    - Documentation of complexity of virtual care encounters, collaboration, and patient/provider journey to further the case for suitable compensation and practice models.

Supporting a Learning Health System

15. **Leverage a networked approach to enhance a BC-wide community of practice to support enhanced care, continuous improvement, and ongoing learning opportunities.**
    - Grow partnerships and advocacy work by "expanding the tent" inclusively with meaningful contributions.
    - Enculturate importance of social accountability values and ethos of collaboration when engaging new partners.
    - Implement learning cycles to incorporate evidence agilely to integrate and adapt to address emergent health gaps.
    - Implementing the Learning Health System phase will further enculturate collaboration and ongoing improvement ethos into practice.
    - Recognizing multiple levels of learning and synchronization, based on evidence.

16. **Communicate and share evidence outwardly across sectors for system integration and change (for and by inclusive range of representative audiences).**
    - Engage partners in integrated knowledge translation and sharing opportunities by and for all "sides" of the partnership pentagram plus from community town-hall tables to peer reviewed research papers.

- Take a participatory approach to inspire mutual learning and sectoral perspective-taking.
- Combine and leverage efforts of communications personnel, academic researchers, educators, and others to develop a wide array of communication tools for awareness, uptake, improvement, practice and scientific contribution, and policy translation.

17. **Engage stakeholders across sectors in planning work to carry recommendations forward, taking into account resource intensity, leadership, priority level, and opportunities for participation and contribution.**
    - Further work must be done in collaboration with RTVS partners and stakeholders to review and assess these recommendations based on clear criteria to determine a well-defined path forward for implementation.

Looking Forward

As RTVS proceeds, the evaluation will support the adoption of the Learning Health System approach and work collaboratively on finding a path towards a "steady state" for RTVS. The evaluation team continues to document pathway lead priorities (see Appendix) for evaluation and in conjunction with the advisory and steering committees will iterate the evaluation questions, priorities, and procedures. The deepening of evaluation includes robust access to provincial and other administrative databases. In the short-term, Year 2 will see the establishment of a robust, multi-dimensional evaluation framework with ongoing dialogue informed by data for continuous calibration.

Our evaluation thus far suggests that RTVS has an encouraging impact on **health system integration,** by improving outcomes related to equity, culture change in the healthcare system, a closer integration with PTN, and longitudinal, team-based care. RTVS offers BC residents increased access to timely care/support, including the opportunity to receive culturally safe care in place and avoiding unnecessary travel when appropriate. Along with equity, RTVS offers the ability for an increase in collaboration among healthcare providers by breaking down traditional barriers, replacing reluctance and unfamiliarity with a "call a friend" mentality, leading to a more supportive culture in the healthcare system. This collaboration extends beyond VP's, as there has also been a closer integration of PTN through RTVS, tying in with improved access to care. RTVS has also been incorporated into residency curriculum, thus allowing new-to-practice physicians to become familiar and comfortable with reaching out for support when they practice rurally. As RTVS work moves forward beyond the timeframe of this report, partnerships continue to deepen. Notably, the partnership with Northern Health Authority medical affairs team who are supporting RTVS Peer-to-Peer virtual physician teams with contract administration highlights this

commitment to collaboration. Finally, RTVS makes shared platforms possible, which are essential to ensure continuity of care and team-based care.

Acknowledgements

We are incredibly grateful to all of the stakeholders and healthcare providers working on the RTVS pathways, whose clinical and non-clinical contributions underpin this evaluation. We especially thank the many participants that directly contributed to this report and its findings. We are also grateful to the end-users of the RTVS pathways: the patients in BC who have accessed these services for their medical care and the healthcare practitioners that have reached out for support. Finally, we acknowledge that we have conducted this evaluation while working and living on the traditional and unceded territories of many different First Nations in BC.

Bibliography

1. BC Stats. Quarterly Population Highlights [Internet]. 2021. Available from: https://www2.gov.bc.ca/assets/gov/data/statistics/people-population-community/population/population_highlights_2020q4.pdf
2. Statistics Canada. Population and Dwelling Count Highlight Tables, 2016 Census [Internet]. 2019. Available from: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Table.cfm?Lang=Eng&T=703&SR=1&S=87&O=A&RPP=25&PR=59&CMA=0&CSD=0
3. Rural Coordination Centre of British Columbia. RSA Communities [Internet]. 2021. Available from: https://rccbc.ca/rccbc/about-the-jsc/rsa-communities/
4. Government of British Columbia. Rural Practice Subsidiary Agreement [Internet]. Available from: https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/physician-compensation/rural-practice-programs/rural-practice-subsidiary-agreement
5. Turpel-Lafond M. In Plain Sight: Addressing Indigenous-specific Racism and Discrimination in B.C. Health Care [Internet]. 2020. Available from: https://engage.gov.bc.ca/app/uploads/sites/613/2020/11/In-Plain-Sight-Full-Report.pdf
6. Bosco C, Oandasan I. Review of Family Medicine Within Rural and Remote Canada: Education, Practice, and Policy [Internet]. 2016. Available from: https://portal.cfpc.ca/resourcesdocs/uploadedFiles/Publications/News_Releases/News_Items/ARFM_BackgroundPaper_Eng_WEB_FINAL.pdf
7. Centre for Rural Health Research. Out-of-Pocket Costs for Rural Residents When Traveling for Health Care [Internet]. 2020. Available from: https://bcrhn.files.wordpress.com/2020/07/oopc-survey_report_7.16.20.pdf
8. UBC Rural Continuing Professional Development (RCPD) Program. Rural Emergency Medicine Needs Assessment British Columbia, Canada [Internet]. 2015. Available from: https://ubccpd.ca/sites/ubccpd.ca/files/2015-Report-Rural-EM-Needs-Assessment.pdf
9. Canadian Institute for Health Information. Care in Canadian ICUs [Internet]. 2016. Available from: https://secure.cihi.ca/free_products/ICU_Report_EN.pdf
10. McMahon M, Nadigel J, Thompson E, Glazier RH. Informing Canada's Health System Response to COVID-19: Priorities for Health Services and Policy Research [Internet]. 2020. Available from: https://www.longwoods.com/content/26249/informing-canada-s-health-system-response-to-covid-19-priorities-for-health-services-and-policy-r
11. Canadian Medical Association. WHAT CANADIANS THINK ABOUT VIRTUAL HEALTH CARE [Internet]. 2020. Available from: https://www.cma.ca/sites/default/files/pdf/virtual-care/cma-virtual-care-public-poll-june-2020-

e.pdf
12. Canadian Medical Association. Virtual Care [Internet]. 2021. Available from: https://www.cma.ca/virtual-care
13. Bestsennyy O, Gilbert G, Harris A, Rost J. Telehealth: A quarter-trillion-dollar post-COVID-19 reality? [Internet]. 2020. Available from: https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality

Appendices

Evaluation Framework

The RTVS Evaluation Framework has been iteratively developed over the past year. The most recent version includes elements from the area of Benefits Realization frameworks (generally applied to business management and programs). All of the framework's guiding themes and stated aims have been thoroughly cross-referenced with relevant, foundational evaluation framework(s):

- Quadruple Aim (4A): population health outcomes (HO); patient experience of care (PtE); HCP experience of care (PrE); cost factors (C)
- Social Accountability (SA): relevance (R), quality (Q), equity €, cost-effectiveness (C)
- BCPSQC Quality Matrix (BCQ): respect (Re), safety (S), accessibility (Acc), appropriateness (App), effectiveness (EFT), equity (E), efficiency (Effic)

Theme/Aim	Benefit	Outcome	Measure	Data Source	Access	Cross-Ref
Safety Net	**Are patients able to access timely, appropriate care virtually, regardless of where they reside in BC?**	Unattached patients are able to access timely care virtually Patients are able to access necessary care virtually, even with closures/limited service in community Rural/remote patients can access appropriate care virtually from home, thereby reducing need to travel outside their community Improved patient safety and outcomes Indigenous patients are able to access culturally safe care virtually	Number of ED/UPCC visits averted Number of patients able to be treated in community (or number of out-of-community visits averted) Number of virtual encounters	MOIS/KDR (retrieve patient PHNs to link to admin data) MSP PTN/BC EHS /BC Trauma Registry NACRS/DAD Patient/provider surveys/interviews	HA Decision Support > MOH > PopDataBC Lists of VPs on each pathway Anonymous surveys sent to patients post-call	4A: PtE; HO SA: R, E BCQ: S, Acc, App; Eq; Effic

Theme/Aim	Benefit	Outcome	Measure	Data Source	Access	Cross-Ref
Funnel	**Are patients directed to the most appropriate healthcare service?** **Are patients directed to a primary care network (or other team-based care) for longitudinal, patient-centred care?**	Patients re-directed to another type of health service more appropriate for their care needs Patients connected to team-based care Indigenous patients are provided with longitudinal, culturally safe care Improved care coordination; cross-pathway collaboration	Number of patients re-directed to another level of care Number of unattached patients attached to primary care network or family provider Use of eHealth tools (MOIS)	MSP NACRS/DAD Patient surveys/interviews MOIS	HA Decision Support > MOH > PopDataBC	4A: HO; PtE; PrE SA: Q, R, E, CE BCQ: S, Acc, App; Eq; Efflc
Fire Department	**Does RTVS positively impacts rural/remote providers and communities through its diverse functions?** **Does RTVS build capacity for rural/remote healthcare providers?**	Rural/remote providers' sense of professional isolation is improved Rural/remote providers' clinical confidence is improved Increased use of technology at point-of-care Rural/remote communities are appropriately supported and able to access traditionally urban-based expertise	Number of rural/remote providers that contact RTVS for clinical support Number of rural/remote providers that access RTVS for simulations Number of rural/remote providers that access RTVS for other educational support Number of new communities that contact RTVS CPD credits given	Provider surveys/interviews Community surveys (UBC CPD needs assessment) UBC CPD Communication tools (Zoom, Slack)	HA Decision Support > MOH > PopDataBC Lists of VPs on each pathway	4A: HO; PtE; PrE; C SA: Q, R, E, C BCQ: S, Acc, App; Eq; Efflc
Cost-Effectiveness / Cost Factors	**Does RTVS positively impact healthcare utilization, thereby minimizing costs to the health system?**	Decreased ED/UPCC utilization Increased primary care utilization Decreased patient transports Costs of implementing RTVS pathways Decreased out-of-pocket costs to patients	Number of out-of-community patient visits appropriately averted Number of patient transports averted Number of ED/UPCC visits diverted to lower level of care Number of rural/remote providers completing locums	MSP NACRS/DAD PTN/BC EHS Internal admin data (e.g., VP wages) Patient surveys/interviews	HA Decision Support > MOH > PopDataBC Lists of VPs on each pathway	4A:C SA: C BCQ: Effic

Theme/Aim	Benefit	Outcome	Measure	Data Source	Access	Cross-Ref
Recruitment and Retention	**Does RTVS improve the recruitment and retention of rural healthcare providers?**	Reduced professional isolation Improved QoL, clinical confidence, healthcare team satisfaction More providers doing rural locums/placements	Number of new medical grads/IMGs doing locums (or repeating placements) Number of HCPs leaving their positions (ahead of term) Number of HCP positions filled/empty Accreditation; CPD credits given	Provider surveys PRA-BC/RCCBC UBC CPD	Lists of VPs on each pathway HA/Hospital personnel data? Annual reports	4A: PrE SA: Q, R, E, BCQ: Acc, App; Eq; Effic
Sustainability and Partnerships	**Is RTVS sustainable in the long-term and entrenched in the wider health system?** **How do partnerships and collaboration strengthen RTVS?**	Existing RTVS pathways receive funding to continue New RTVS pathways are developed to address existing care needs Existing RTVS stakeholders are engaged throughout service implementation New partners/organizations join RTVS working groups to bring additional expertise Development of RTVS governance model Dissemination of RTVS services/findings to external stakeholders and communities	Number of RTVS pathways launched Utilization of each RTVS pathway (see above) Cross-pathway collaboration (connections of one pathway to another) Number of partners and stakeholders engaged in RTVS Number of RTVS working groups and committees Number of governance documents generated Number of presentations/articles generated	Internal admin data (see above) Communication tools (Zoom, Slack) Stakeholder interviews/surveys Network analysis survey	Lists of stakeholders/ partners	4A: PrE; C SA: R, E BCQ: App, Effic, E

Evaluation Advisory Members

- Jeanette Boyd
- Don Burke
- Jim Christenson
- Scott Graham
- Kendall Ho
- Megan Hunt
- Ray Markham
- Tom McLaughlin
- John Pawlovich
- Jon Rabeneck
- Alan Ruddiman
- Sandra Sundhu
- David Wensley

The UBC Digital Emergency Medicine team is engaged to facilitate this evaluation: The team includes Kurtis Stewart, Amrit Bhullar, Phillip Lopresti, Ivjot Samra, Elsie Wang, and Helen Novak Lauscher. Evaluation contact: Dr. Helen Novak Lauscher, helen.nl@ubc.ca.

Data Collection Tools

Interview Guides	
Stakeholder Interview Guide	- What is your history and involvement with real time virtual support (RTVS) - What is the core value of real time virtual support? - What factors enabled the rapid development and deployment of the pathways? ▪ What strengths are evident in its current state? ▪ What challenges do you see/foresee? - What stakeholders are and have been involved? *What has been the nature of collaboration?* - What has your role/experience been in this journey? What unique and critical factors has your organization contributed to this collaboration? - What is needed for virtual care pathways to continue and grow? What are the upcoming milestones at 90 days and at 6 months that need to be achieved to demonstrate continuing value to the health system? - Do you have an experience or story that you would like to share (past or present) that illustrates the impacts of real time virtual support?
Virtual Physician Interview Guide	- *Please tell me your level of agreement with the following statements (Scale of 1-5)* ▪ The initial training and orientation to the program and my role prepared me to begin work. ▪ I feel comfortable and satisfied with the technology used for this program. ▪ Organizational processes (e.g., scheduling, MOIS functionality) are clear and work well. ▪ I am satisfied with the organizational and technical support I have received. ▪ I am satisfied with the regular virtual community of practice meetings. - What virtual care pathway(s) are you involved in and how did you get involved? (Note: type of practice (e.g., GP/SP), location, years of practice) What drew you to virtual care? *Probe: What contributions do you hope to make? What motivates you?* - What lessons have you learned that stand out to you? *Probe: Lessons you have learned from patients/family? From colleagues, other physicians, RUDi, ROSe, (e.g. Nurses, MOAs, other providers)?* - From your perspective, what are the strengths and successes of the [RTVS] program? *Probe: Can you tell me about any benefits you've observed so far? For patients/family/community, etc.?*

Interview Guides	
	- What is your experience like so far? What has been the most rewarding/meaningful to you? *Probe: Can you share a memorable experience that you've had in this role? What stood out about it? Why was it memorable to you?* - From your perspective, what are the challenges of [INSERT PROGRAM HERE]? What challenges have you experienced? - What are areas of improvement you would suggest for [INSERT PROGRAM HERE]? - From your perspective, what qualities are important for a virtual physician to have/demonstrate? - *From your perspective, how important are the following qualities in a virtual physician? (Scale of 1-5)* ▪ Kindness and empathy; ▪ Clinical expertise; ▪ Knowledge of rural and First Nations communities; ▪ Experience in low resource practice settings; ▪ Comfort with technology; ▪ Cultural safety and humility; ▪ Other (please specify) - From your perspective, what is needed for this service to continue and grow? *Probe: What types of supports are needed? Who needs to be involved? How do you see this program evolving?*
MOA/Nurse Interview Guide	*- Please tell me your level of agreement with the following statements (Scale of 1-5)* ▪ The initial training and orientation to the program and my role prepared me to begin work. ▪ I feel comfortable and satisfied with the technology used for this program. ▪ Organizational processes (e.g., scheduling, MOIS functionality) are clear and work well. ▪ I am satisfied with the organizational and technical support I have received. - Tell me a bit about yourself and how you got involved in the [RTVS] program? - What lessons have you learned that stand out to you? From clients of the [RTVS] program? From coworkers? E.g., other MOAs, physicians? - From your perspective, what are the strengths and successes of the [RTVS] program? - What is your experience like so far? What has been the most rewarding/meaningful to you? - From your perspective, what are the challenges of the [RTVS] program? What challenges have you experienced? - What are areas of improvement you would suggest for the [RTVS] program? - From your observations, what is important for the client/patient/family to have a good experience? - From your perspective, what is needed for this service to continue and grow? *Probe: What types of supports are needed? Who needs to be involved?* - Is there anything you would like to add that you haven't had a chance to share?
RTVS End-User Interview Guide	- First, can you tell me a bit about your practice and the virtual care pathway(s) that you have used? ▪ *What type of practice (e.g., GP, specialist, nurse)? How many years of practice?* ▪ *Where do you practice? What type of community (e.g., rural, remote, Indigenous)?* ▪ *RTVS pathways used: RUDi, ROSe, Dermatology, other specialty (maternity, pediatrics).* ▪ *How often pathway(s) is used? Approximate number of times called (since April 1, 2020)?* *- Please tell me your level of agreement with the following statements (Scale of 1-5)* ▪ The information or introduction to the RTVS pathway(s) prepared or encouraged me to use it in my practice. ▪ I feel that providers in rural communities are aware of these services/pathways. ▪ I feel comfortable and satisfied with the technology used for this program (e.g., Zoom video). ▪ Calling the virtual pathway increased my comfort managing the patient(s). ▪ Calling the virtual pathway positively affected the outcome for the patient(s). - Can you characterize the reasons/types of cases for which you have used RTVS (e.g., RUDI, ROSe, etc.)? - Can you think about one (or more) memorable case(s)? ▪ What stood out about it? Why was it memorable to you? ▪ What was the reason for the call? What happened? What was the outcome? ▪ Without *RTVS*, what would you have normally done/what would have happened? (e.g., probe: Did this call change your mind whether to transfer this patient or not?) ▪ Based on the call, will you make a change in the way you manage patients in similar situations? Please explain. ▪ Is there anything else about this call that you would like to add?

Interview Guides	

	- From your perspective, what are the strengths and successes of the RTVS Service?
	  ▪ Can you tell me about any benefits you have observed so far? For patients/family/community or yourself?
	- From your perspective, what are the challenges of using the RTVS Service? For your regular practice? What challenges have you experienced in trying to access virtual support?
	- What are areas of improvement that you would suggest for the RTVS Service?
	- What does having access to this type of service mean to you? Professionally/in your practice? For you personally? What does this type of service mean for your community as a whole?
	- Overall, has your experience so far made you more favorable/neutral/less favorable of using virtual care for managing your patients?
	- *What qualities are important for a virtual care consultant to have? Skills? Knowledge? Personal characteristics? Experiences? (Scale of 1-5)*
	  ▪ Kindness and empathy;
	  ▪ Clinical expertise;
	  ▪ Knowledge of rural and First Nations communities;
	  ▪ Experience in low resource practice settings;
	  ▪ Comfort with technology;
	  ▪ Cultural safety and humility;
	  ▪ Other (please specify)
	- What types of supports are needed by you and other practitioners in your community? Are there particular clinical areas that are needed (e.g., Pediatrics, mental health, other)?
	- Is there anything you would like to add that you have not had a chance to share? Any other comments or feedback?

Surveys	
RTVS Peer-to-Peer (RUDi, MaBAL, CHARLiE, ROSe) Virtual Physician End-of-Shift Survey	- Date and time of shift - What type of calls did you provide and how many of each during your shift? - For the clinical call(s), what medical condition(s) did you support and what type of support did you provide? (Please list as applicable). - From which community or communities in BC did the provider(s) call you? - How many calls used video (e.g., Zoom video)? - Did any of your consultations involve patient transport coordination? - What was the average length of calls? What was the length of the longest call? - Were any other RTVS pathways or health services involved in your calls?

HEiDi Patient Survey	- Are you completing this survey for yourself or someone else?
	- Before the 811 call with the virtual physician, what were you planning to do next?
	- After the 811 call with the virtual physician, what do you plan to do next (or what did you do)?
	- Is your planned action the recommendation by the 811 physician?
	- How likely are you to follow the 811 physician's advice? (Scale of 1-10)
	- Was your call COVID-19 related?
	- Do you have a primary care provider (e.g., family doctor, nurse practitioner)?
	- Compared to before your 811 physician call, how is you anxiety after your call? (Level of anxiety scale of 1-10)
	- The 811 physician was caring and kind. (Agreement scale 1-10)
	- The 811 physician listened to me and understood my concerns (Agreement scale (1-10)
	- Did you use video when speaking with the virtual physician?
	- Rate your overall satisfaction with the 811 physician call (Scale 1-10)
	- Please rate your agreement with the following statements about the consultation process (Scale 1-5)
	  ▪ The scheduled consultation time was convenient for me.
	  ▪ The consultation started on time.
	  ▪ The length of the consultation with the physician and time spent addressing my health needs was appropriate.
	  ▪ The overall process was easy and worked well.
	- What is most important to you right now? (Select all that apply)

Year 1 RTVS VP Survey	- Before joining RTVS, did you have any experience in delivering virtual care to patients or providing virtual support to colleagues?

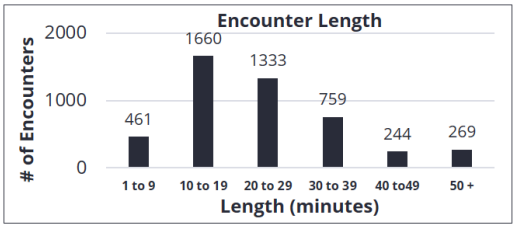
	- Have you taken any courses or training for delivering culturally competent/safe care to Indigenous patients (e.g., San'yas)?
	- Before joining RTVS, did you have any experience delivering care in rural or remote settings?
	- Are you a current member of the BC Emergency Medicine Network?
	- Which RTVS pathway(s) do you work on (currently or previously in the past year)? Please select all that apply.
	- For each statement below, please indicate your level of agreement. When answering, consider your experiences working on your respective RTVS pathway(s).
	  ▪ I was satisfied with the on-boarding and orientation process when I joined RTVS.
	  ▪ I am satisfied with the number of shifts that I work each month and the scheduling process.
	  ▪ I am satisfied with the frequency of and content discussed at my pathway's regular Community of Practice meetings.
	  ▪ I am satisfied with the technology used while on an RTVS shift (e.g., Zoom, MOIS EMR).
	  ▪ I enjoy delivering patient care or peer-to-peer support virtually while on shift.
	  ▪ I believe RTVS has positively impacted patients and providers during the COVID-19 pandemic.
	  ▪ I believe RTVS has helped build capacity for rural and remote providers (e.g., improved clinical skills and confidence).
	  ▪ Overall, I am satisfied with my experience as a RTVS Virtual Physician.
	  ▪ I believe RTVS should be part of the standard of care in BC.
	- While working a RTVS shift, have you been involved in any cases where patient transport was appropriately avoided or expedited? (Note, this question may be more applicable to Virtual Physicians working on peer-to-peer pathways.)
	- While on a RTVS shift, have you ever connected to another pathway for additional support during a consultation? Or have you been contacted by another pathway to support a case? If this has happened on at least one occasion, please select all pathways below that you have connected with.
	- As a RTVS Virtual Physician, have you provided education to or participated in simulations with rural colleagues?
	- Do you have any suggestions to improve the evaluation of RTVS or other feedback regarding this work?
	- Do you have any final comments or thoughts that you would like to share about the first year of RTVS?

Supplementary Findings

FNvDoD & FNvSUPS

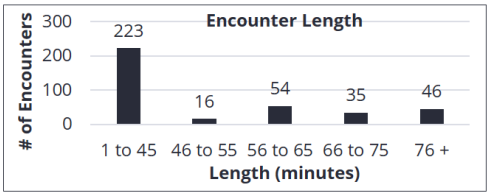
FNvDoD

	Total Encounters	Unique Clients
Vancouver Coastal	320	174
Fraser	949	518
Interior	1,164	531
Vancouver Island	1,726	740
Northern	1,869	730
Total	**6,028**	**2,693**



FNvSUPS

	Total Encounters	Unique Clients
Vancouver Coastal	68	26
Fraser	199	79
Interior	185	61
Vancouver Island	213	75
Northern	447	158
Total	**1,112**	**399**



HEiDi Cost-Minimization Analysis

Our preliminary analysis of HEiDi costs for the first year is detailed in the table below. We calculated the total costs needed to provide the HEiDi service (VP wages, VMOA salaries, project/office manager salary). We estimated the costs saved by the health system from HEiDi VP's diverting patients away from ED/UPCC visits to treatment at home or seeing their usual care provider within one week. We also calculated the out-of-pocket costs potentially saved by rural patients who were re-triaged to green/black. We estimate that the total net system costs minimized by HEiDi for the first year are **$2,603,628.31**. And the total societal costs minimized are **$7,872,616.00**.

Year 1 – April 6, 2020 – March 1, 2021	Per hour/visit, other multiplier	**$ Total**
HEiDi Service Expenses		
VP hours	13,140	
Hourly VP wage	$145.00	$1,905,300.00
VMOA salaries	$46,676.00	$186,704.00
Project/office manager salary		$50,000.00
(A) Total Expenses		**$2,142,004.00**
System/Patient Costs Minimized		
Number of HEiDi consultations	30,682	
Proportion of patients down-triaged (74%)	22,705	
Proportion of patients adhering to VP advice (97%)	22,024	
Proportion of rural patients (16%)	3,524	
(B) Out-of-pocket costs avoided for rural patients ($2,234/patient)		***$7,872,616.00***
Proportion of patients going to each of ED or UPCC (50% each)	15,341	
Estimated ED costs minimized ($321.96/visit)		$3,545,349.40
Estimated UPCC costs minimized ($109.00/visit)		$1,200,282.91
(C) Estimated health system costs avoided (sum of 2 above)		***$4,745,632.31***
(D) Total Costs Minimized (B+C)		**$12,618,248.31**
Net Health System Costs Minimized (C-A)		**$2,603,628.31**
Net Societal Costs Minimized (D-A)		**$10,476,244.31**

RTVS: Pathway Evaluation Priorities

The goal of this table is to list the key evaluation priorities for each RTVS pathway, categorizing each by whether it is common across all 6 pathways, specific to the type of pathway, or specific to that pathway only. These evaluation priorities were elucidated through semi-structured "consultations" conducted with each of the pathway leads (starting December 2020 through April 2021). The evaluation priorities and outcomes are grounded in several validated evaluation frameworks that have informed the Year 1 evaluation of RTVS (e.g., Quadruple Aim, Social Accountability, Benefits Realization, BC PSQC Matrix). Evaluation priorities and questions are further detailed in other documents and cross-referenced with different measures, methods, and data sources that will answer them.

<table>
<tr><th></th><th>FNvDoD/SUPS</th><th>HEiDi</th><th>RUDi</th><th>ROSe</th><th>CHARLiE</th><th>MaBAL</th></tr>
<tr><td>Common Cross-Pathway Evaluation Priorities</td><td colspan="6">• <u>Equitable access</u> for rural, remote, and Indigenous communities
• <u>Service growth and reach</u> (uptake and utilization by different communities, health authorities; determining which communities are not using RTVS)
• Documenting <u>RTVS "firsts"</u> (e.g., remote community birth)
• Documenting cross-pathway <u>collaboration and integration</u> with other services
• Documenting use of <u>shared EMR and other technology</u> that enables virtual care</td></tr>
<tr><td>Common Priorities by Pathway Type (Patient-Facing v. Peer-to-Peer)</td><td colspan="2">• <u>Safety net:</u> Providing patients timely access to appropriate virtual care
• <u>Funnel:</u> Connecting patients to appropriate longitudinal primary care
○ Navigating the health system
○ Connecting patients to care within their community
○ Reducing ED visits when appropriate</td><td colspan="4">• Equitable on-demand support (i.e., ensuring rural providers have access to same types/levels of support as urban providers)
• Rural providers' quality of life, clinical confidence, isolation/burnout
• Equitable resourcing and cost factors
○ Broadband connectivity (i.e., ensuring community providers can have video consultations)
○ Recruitment and retention of rural providers (e.g., recruiting new medical grads, providers remaining in communities)
○ Decreasing patient out-of-pocket costs
• Facilitating patient transport coordination (expediting or avoiding as appropriate)
• "Unintended" positive consequences (e.g., pathways taking first calls from certain communities)
• Documenting consultation complexity (e.g., length of calls, multiple calls for one consultation)
• Documenting <u>fire department</u> activities and impact (e.g., outreach, education, simulations, accreditation)</td></tr>
<tr><td>Pathway-specific Evaluation Priorities/ Questions</td><td>• Providing quality culturally safe care
• "Closer to home care" for Indigenous patients</td><td>• Are HEiDi callers provided with appropriate health information?</td><td>• Document call complexity with respect to role of MRP and implications for</td><td>• Documenting high-impact cases
• Documenting use of ROSe app</td><td>Documented May 2020 – in process
• Impact that geography and rurality has on the</td><td>In process</td></tr>
</table>

	• Coordinated longitudinal care for Indigenous patients • Considering distance - geographical, contextual, cultural • Considering racial disparities	• Are callers appropriately triaged to a less/more urgent care disposition by HEiDi? • Are callers satisfied with the care advice given by HEiDi? Are callers less anxious after speaking with a HEiDi VP? (Caller experience) • Are callers appropriately referred back to their usual care provider by HEiDi? • Are callers appropriately directed to other/specialist in-person care services by HEiDi? • Does HEiDi support different health concerns? • Does HEiDi contribute to primary care transformation within the wider health system? • Does HEiDi follow-up with callers to ensure safety and care continuity? • Does HEiDi lead to better caller health outcomes? • Does HEiDi appropriately divert callers away from urgent in-person care? • Does HEiDi contribute to COVID vaccine surveillance and monitoring of possible AEFI? • Does HEiDi preserve healthcare system resources (e.g., preserve ED capacity)? • Are HEiDi providers satisfied with the care that they provide? • Is HEiDi a cost-effective service?	remuneration models • Exploration of role of virtual emergency department		management of children with infectious diseases in BC's rural/remote areas • Impact of a rapid health service redesign (24/7 pediatric virtual care) on the health outcomes of children, and on patient, parent, and health experience, in BC's rural and remote regions. • Longer-term post-COVID legacy impacts, including improved care for children in rural and remote areas	

RTVS Voices

Patients and Families

"Such a beneficial & efficient service, wow! The nurse was very helpful and kind. The doctor was so smart, kind & efficient. Intently listened to my concern, asked the right questions, clearly explained diagnosis and then gave me next steps I implemented immediately at home and felt so much butter even a day later!" – HEiDi Caller
"I feel heard, listened to, respected and understood. I appreciate that the doctor has a deep understanding of Indigenous culture. As an advocate for marginalized populations I feel this is the BEST fit to ensure our people are not only treated with dignity and respect but also receive the highest quality of care." – FNVDoD Client
"I attended a call with my daughter yesterday and [the doctor] called us back right away. I have not felt that respected, supported and understood from anyone in the medical industry in a very long time. She made our difficult situation so much easier to deal with…We both cried from relief after we got off the phone because we were provided an easy to follow holistic plan and felt like we were heard. Thank you for this critical service for people who are not always treated kindly in this industry. It meant the world in our time of need." – FNvDoD Client
"I feel so much safer & secure about not having to determine by myself whether to wait/monitor symptoms or take further steps, or scare myself with Google searches, having a nurse/physician at my fingertips to help me make the right decision is absolutely amazing, thank you so very much for this!" – HEiDi Caller
"I'm a senior who lives alone and the guidance and reassurance [the doctor] gave was remarkable, as was the short wait time (~30 minutes)." – HEiDi Caller
"It was super easy to make an appointment, I felt like the quality of my appointment was better than face to face experiences. My doctor was very thorough and approachable, down to earth. I am going to recommend this service and I hope funding will continue beyond COVID. 10/10 experience!" – FNvDoD Client
"Connecting to a virtual physician is an excellent idea and I hope it continues beyond COVID. I wasn't able to see my family doctor in a timely manner and needed to better understand how to handle my concussion. Speaking with the HEiDi VP was a discussion rather than a one-sided delivery of information. He helped me figure out a plan." – HEiDi Caller
"This service was extremely reassuring and settling. We felt comforted that watching the symptoms without rushing to emergency was reasonable and smart for this serious condition as I am at risk of stroke or heart attack." – HEiDi Caller
"Thank you HealthLink BC for this outstanding service which I used for the first time last night. I'm a senior who lives alone and the guidance and reassurance [the doctor] gave was remarkable, as was the short wait time (~30 minutes). I will be sharing my positive experience of this new way to use health care dollars more effectively with my health care providers, family and friends." – HEiDi Caller

RTVS Peer-to-Peer Pathway End-users

"We are able to provide better service to clients and support us in our practice so we are more likely to stay in this line of work. Supporting the longevity of our careers and recruitment and retention in these areas." – Remote Community Nurse
"The virtual physicians [VPs] listen. They are empathetic. They value our experience and what we are seeing. They communicate well with us. They obviously care about and value what we are doing. We feel valued as well." – Remote Community Nurse
"I cannot imagine practicing in rural and remote BC without the RTVS pathways" – New-to-practice Family Doctor
"We went from having 4 hands to 8 hands. The most rewarding was working with an interdisciplinary team, seeing them come together with core values of the service." - Midwife, discussing collaboration with MaBAL and CHARLiE
"[RTVS] is a good bridge for patients. There can be 2-3 week waitlist for the doctor or we only have a doctor once a week. It's like another avenue for patients to call without having to wait so long." – Remote Community Nurse
"I can't express enough how grateful I am as a relatively new practice physician in rural BC to have RUDi, ROSe, CHARLiE and all the lines and tools that have been rolled out….Very quickly these supports have been very integrated to how I practice in the clinic and Emergency. Access to these services in the nick of time has changed outcomes." – Rural GP
"The VP's listen, they are empathetic, they value our experience and what we are seeing" – Remote Community Nurse
"The VP's understand the context, cultural safety, without having to explain the reality of what you're doing or where you are" – FNHA Remote Community Nurse
As a new-to-practice family doctor who's often working in remote communities where I'm the only physician, being able to call in for support and help with assessment and management has been invaluable. When I encounter novel and stressful situations, I can call for immediate help. I have used the RUDi line in particular on multiple occasions and it has made a difference in patient care. Today I was able to avoid transferring a patient out of the community with their help. I feel confident practicing in these remote settings knowing I have highly capable, readily available support in my back pocket who can understand the low resource context I'm working in. I'm also involved in a new rural virtual simulation project, and we will be working with RTVS/RUDi to help facilitate our simulations and give feedback to rural providers to help us keep learning and developing our medical knowledge and skills. I cannot imagine practicing in rural and remote BC without the RTVS pathways." – New-to-practice Physician

RTVS Providers/Virtual Physicians (VP)

"I've not only witnessed the benefits of the program for other healthcare providers and patients, but my own team as well. Being one of two Pediatricians available in the community leaves little room for breaks. Before CHARLiE, having adequate time off was a rarity as there was virtually no alternate available. After CHARLiE [we] no longer felt alone or without support." – General Pediatrician and CHARLiE VP
"The strengths of the service is that it has been created by Indigenous people for indigenous people with the common goal of providing timely access to medical care in rural and remote communities in a culturally sensitive manner." – FNVDoD VP
"Instead of having to move a patient, the patient was able to stay in their own community" – CHARLiE VP
"In the case of high-risk alcohol withdrawal management: developing a management plan in rural community where patient wanted to be, felt safe. Was a very satisfying case. RTVS is supporting rural physicians, who are vital to the health of the patient population in BC and elsewhere. RTVS is improving access to care for patients in BC." – RUDi VP
"RTVS certainly has a hand in enhancing rural equity. The big success is being able to reach Indigenous communities and those really remote communities." – MaBAL VP
"Thank you for making this service available to our vulnerable communities. Even not having a call still makes me feel we are creating a safety net for our colleagues working in challenging environments." – RUDi VP
"I felt a lot more confident and a lot more reassured knowing that there was a wrap-around team, even if they weren't there in person. If I needed help or support, particularly acute bedside help or support, then you know, when there is only one provider or two providers on the ground, being able to pick up the phone and call and have another team member available virtually, one or two team members. Whether that's MaBAL or CHARLiE or the other services, to help in whichever way I needed was incredible." – MaBAL VP
"It has provided an opportunity to develop a community to support practitioners in rural and remote communities, but as an urban specialist practitioner it has helped me to understand challenges faced by patients and practitioners in rural areas and I hope to respond these more effectively." – CHARLiE VP
"In the past, I did not think [virtual care] would work and now I see that it does. And I know it's been a long time getting to this point so actually in the beginning I think it didn't work but they've got a system now that works and in fact now I teach ultrasound virtually as well" – MaBAL/RUDi VP
"I think [RTVS] will improve the ability of rural BC to recruit and retain physicians as these new doctors will finally be supported to do a good job despite still being a bit 'green'." – RUDi VP