

2017

**Dakota County Office of
Performance and Analysis**

REPORT

September 2017

**Dakota County Public Health Department:
Video Directly Observed Therapy for
Active Tuberculosis Treatment**



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Executive Summary

The primary focus of this report is to determine interest among Dakota County active tuberculosis (TB) clients in a proposed Video Directly Observed Therapy (VDOT) program, analyze the feasibility and cost-benefit of implementing a VDOT program, and evaluate technology vendor options for VDOT.

Tuberculosis (TB) is a contagious disease spread through airborne exposure. Adherence to a treatment regime is crucial in ensuring the recovery of clients and preventing the disease from spreading. Successful treatment involves 6 to 12 months of delivering a multi-drug therapy daily. Currently, Public Health professionals schedule daily home visits to observe clients taking their treatment. This approach is known as Directly Observed Therapy (DOT) and is the standard care for patients with active TB.ⁱ

VDOT is an alternative treatment approach that involves a Public Health Nurse remotely observing client treatment via video, rather than conducting a home visit. Two VDOT options are available (synchronous and asynchronous). Synchronous VDOT is the real-time video observation of client treatment. Asynchronous VDOT has the client upload a video of their treatment, which is later viewed by a Public Health Nurse. Both options eliminate the need for several home visits per week, but asynchronous VDOT supports a client-focused treatment plan allowing for medication scheduling outside of normal business hours.

Although VDOT has not been previously utilized for TB treatment within Minnesota counties, this treatment option is very common in other states, including Washington, Texas, and California. States that have utilized VDOT consistently report employee cost and time savings. The Minnesota Department of Health and Minnesota IT Services (MN.IT) have been actively researching the feasibility of VDOT services and are promoting potential partnerships with counties to serve as a pilot program.

Current and former Dakota County clients receiving TB treatment over the past 3 years (2014-2016) were surveyed and responses indicated that 67% would have been “likely” to utilize VDOT treatment options, if they had been available. This level of participation would have resulted in an annual reduction of 48% of active TB-related home visits, while still maintaining customer service through weekly in-person client meetings. In terms of cost savings through staff time and direct expenditures, it is estimated that implementing a VDOT program, assuming participation of 6 clients per year, would annually result in \$1,515 in cost savings per client and \$9,091 in overall cost savings for Dakota County.

A limited number of companies provide asynchronous and privacy-compliant VDOT services. Common pricing structures are based on a per-client per-month basis, which ranges from \$36 to \$339 per month. Through their pilot program initiative, the State of Minnesota also has arranged to provide the service free of charge to counties, where county expenses would be limited to staff and client equipment.

As a result of the estimated cost savings and increased convenience to staff and clients, the recommendation is to pursue the implementation of client opt-in asynchronous VDOT services through the draft agreement with Minnesota IT Services (MN.IT).

Recommendations

With the State of Minnesota's recent progress in developing a low-cost VDOT solution through MN.IT and Vidyo, a future partnership with Dakota County and other counties throughout Minnesota is a logical step forward.

The only remaining costs to Dakota County would be staff time, which would be reduced from the past daily visit routine, county provided phones for client VDOT use, and some initial staff training on appropriate use of VDOT and the accompanying software. From the cost-benefit analysis, per client annual savings are anticipated to average approximately \$1,500. This savings in time and mileage will help offset any costs associated with providing the limited number of client phones.

The partnership with the State of Minnesota for VDOT services should produce actual cost (mileage) and time savings, as well as more convenient interactions between clients and Public Health employees.

Considering the benefits of pursuing an asynchronous VDOT program, the following program features are recommended.

1. **Partnership with the State of Minnesota.** Given the low-cost option available through the State of Minnesota, it is recommended that Dakota County pursue a partnership with the State of Minnesota (Draft Joint Powers Agreement – Appendix E). The proposed agreement was drafted by Community Services contract personnel, working with Public Health staff.

If an agreement with the State of Minnesota is not pursued, further consideration of a two-year contract with SureAdhere is recommended. The two-year contract offered through SureAdhere would provide the lowest cost alternative (after the State of Minnesota) and would still offer tangible time and cost savings under the majority of use scenarios.

2. **Ongoing Weekly Visits.** After successful completion of an initial treatment phase of daily in-home visits (approximately one to two months depending upon the client), interested clients may switch to daily VDOT reporting with weekly in-home visits. This approach is in agreement with previous concepts proposed by Dakota County Public Health.
3. **Opt-in Participation.** While acknowledging the benefits of a VDOT program, Dakota County should continue to offer the client the option to switch back to daily in-home visits. This approach is in agreement with previous concepts proposed by Dakota County Public Health.
4. **Option for County Provided Phones.** In order to ensure equity in client access to service options, Dakota County should make available phones for client VDOT use. OPA and Public Health Staff discussed options with Scott Jara in IT and the topic was discussed at an Informational Management Steering Committee (IMSC) meeting. Dakota County IT should conduct a final review of the proposed phone purchase to ensure appropriate security considerations.

Next Steps

Dakota County should consider the following next steps for the proposed VDOT program and in pursuing program implementation.

1. **Joint Powers Agreement Review.** As of early September, a final review of the draft Joint Powers Agreement with the State of Minnesota (draft agreement – Appendix E) is currently being conducted by the County Attorney’s Office. Public Health, Community Services contract staff, the County Attorney, and the State of Minnesota have already completed initial reviews of the agreement. The agreement is scheduled for consideration by the Dakota County Board of Commissioners in the first half of September 2017.

Secondary Option. If an agreement cannot be reach with the State of Minnesota, efforts should be made to obtain VDOT services through SureAdhere.

2. **HIPAA and Other Data Considerations.** Although initial feedback for the proposed program has been favorable and the State of Minnesota endorses the program’s approach, a final review of data privacy considerations should be conducted by Community Services HIPAA Data Privacy Office.
3. **County Phones for Optional Client Use.** Purchases should be initiated for two client phones that have been budgeted, and follow-up consultations should take place with Dakota County IT staff to ensure that the phones are appropriately secured and provisions are made for client use.
4. **Internal Policies.** Final review should be conducted internally of any Dakota County Public Health policies and procedures that may be impacted by the implementation of VDOT services for TB. One resource for a sample “Consent to Participate in Store-and-Forward Video Directly Observed Therapy” is within MDH’s “Video Directly Observed Therapy (VDOT) Took Kit,” available online at www.health.state.mn.us.
5. **Six-Month Survey.** After a client has participated in the Tuberculosis VDOT program for six months, completion of a follow-up survey is recommended (sample survey – Appendix D). The intent of the six-month survey is to gain feedback regarding what aspects of the program need to be revised and to evaluate customer satisfaction.

Project Background and Overview

Tuberculosis (TB)

Tuberculosis (TB) is an infectious disease, which usually affects the lungs and is transmitted through the air. Common symptoms include cough, fever, night sweats, and weight loss.

There is a distinction between two types of TB that individuals may carry. The first is “Latent TB,” which is not contagious and dwells within an individual’s immune system in an inactive state with no symptoms. The second type of TB is “Active TB,” which is contagious and exhibits signs of infection. Individuals with weakened immune systems are particularly vulnerable to contracting TB, including very young and elderly individuals.

The prevalence of TB in the United States is greater in foreign-born populations.ⁱⁱ The foreign-born TB infection rate is higher in Minnesota, where 82% of TB cases are foreign-born individuals compared with a national average of 59%.ⁱⁱⁱ Reviewing 2015 statistics for active cases, the lower rate of TB in the United States becomes apparent when considering worldwide population and infection rates. When compared with world population, the active rate for TB cases in the United States becomes more dramatic. The U.S. has 4.4% of the world’s population, but only 0.1% of the world’s active TB cases.

Worldwide – 10.4 million active TB cases (2015)
United States – 9,557 active TB cases

The active TB rates in Minnesota and Dakota County are in line with the overall rate for the U.S. Minnesota has 1.7% of the population in the United States and 1.6% of the active TB cases. Dakota County has 7.5% of Minnesota’s residents and 6.7% of the state’s active TB cases.

Minnesota – 150 active TB cases (annual average)
Dakota County – 10 active TB cases (annual average)

TB treatment is very effective if taken as prescribed, but not following or completing treatment can result in an individual remaining contagious and can contribute to the development of a MDR TB (multi-drug resistant TB) or XDR (extensively drug resistant TB). As a result, the importance of having individuals with active TB cases complete their drug treatment protocol is crucial in controlling spread of the disease and in further development of drug-resistant strains.

TB Clients in Dakota County

From 2015-June 2017, Dakota County served 30 TB clients. The age of our TB clients ranged from under-5 years of age up to nearly 90. Clients were about as likely to be male or female. More than 2 out of 3 of cases occurred in Apple Valley, Burnsville, and Eagan, with no clients living in our more rural First District, in the south and east part of Dakota County.

Current Approach: Directly Observed Therapy (DOT)

The Dakota County Public Health Disease Prevention & Control Unit provides case management for clients with active TB. Public Health Nurses and Community Health Workers make daily home or workplace visits to clients with active TB to ensure that clients are successfully treated, which typically involves nine to twelve months of multi-drug therapy.

This daily, in-person delivery of medications (up to ten pills) and observation of ingestion is called Directly Observed Therapy (DOT). On the workday proceeding weekends or holidays, Public Health workers will provide adequate medication to cover treatment, when Dakota County offices are closed. When clients have latent TB, Public Health Nurses provide monthly case management visits, at a minimum. In some instances, nurses provide latent TB clients with weekly DOT therapy for a specific antibiotic therapy course that is completed in a shorter amount of time.

Based upon home visiting data from 2014 to 2016, Dakota County Disease Prevention staff conducted an average of 129 active TB home visits per month. This caseload can vary widely and ranges between 67 and 256 visits per month, depending upon the length that an individual needs to be on medication. Public Health visits are crucial in ensuring that TB does not spread or that the infection does not develop into a more advanced or drug-resistant form of the disease.

This approach requires coordination between Public Health and clients to assure treatment at the same time every day. This requirement causes inconvenience for both parties. Clients need to adjust their daily schedule and have Public Health professionals in their homes every weekday. Public Health employees are required to drive to the client homes, rather than using that drive time for more productive work activities.

The DOT protocol helps prevent TB from spreading, but creates ongoing inconvenience for clients and staff time and mileage costs for Dakota County. Utilizing technology to ensure that quality is maintained, while improving customer service and lowering costs is the goal of VDOT.

VDOT Option

Telemedicine provides opportunities to address challenges associated with the current DOT approach. Utilizing video, Public Health Nurses can observe clients taking TB medication every weekday. Although this is a fairly new technology and states have adopted statutes around insurance reimbursement of VDOT at varying times, Minnesota counties have the advantage of looking at model programs in other states. Also, the Minnesota legislature has enacted legislation to address reimbursement concerns and the Minnesota Department of Health (MDH) has compiled an inventory of resources to allow for an easier implementation of VDOT programs.

Two types of video technology are associated with VDOT. The first is synchronous VDOT, which enables real-time viewing of clients taking their daily TB medication. The second is asynchronous VDOT, which is characterized by clients taking a date and time stamped video of themselves for uploading to a secure online location for later viewing by a Public Health Nurse. Since asynchronous VDOT has the benefit of being both more convenient for the client and Public Health professional and results in greater flexibility and cost savings than real-time VDOT, this is the option being pursued by Dakota County.

Project Overview

The purpose of this project is to review the feasibility for implementing a client-option asynchronous VDOT program. The intent would be to provide the same level of service, while increasing customer convenience, ensuring privacy, and saving staff time. Analysis includes a review of proposed program costs and benefits, as well as overall program feasibility.

- Features of proposed program
 - **Optional participation.** If clients do not feel comfortable with technology or would prefer continuing with daily visits, that option would remain available. Other limitations, which may prevent participation, include language barriers, very young or elderly participants, high risk individuals, and individuals with past difficulties maintaining treatment compliance. As the CDC states, “(VDOT) doesn’t have to be an all or nothing approach; it may work for some patients, but not all, and it may work for some part of treatment, but not all.”^{iv}
 - **Access provision.** If clients face limitations in their access to relevant technology, which would otherwise prevent their participation, an option would be available to utilize a Dakota County provided phone.
 - **Treatment initiation and maintenance.** Until clients are established in their treatment regiment, the first one to two months, or an otherwise determined duration of care, would involve daily Public Health visits. After successful completion of the initial period of treatment, clients would have the option to begin the VDOT program and would receive a weekly visit from a Public Health Nurse to answer questions, coordinate care, provide the upcoming week’s medication, and evaluate the client’s health, including any change in symptoms or client condition.
- Review of proposed program
 - **Cost/Benefit.** This report will review the technical, staffing, and monetary costs related to the proposed VDOT program. Non-monetary costs and benefits are also reviewed.
 - **Feasibility.** Program feasibility will be reviewed, including technology options, costs (start-up and ongoing), and staffing needs.
 - **Survey.** A survey was conducted to gauge the anticipated participation, as well as evaluating time of day convenience, language issues, and technological barriers.
 - **Technical analysis.** Options were reviewed, which would provide asynchronous VDOT service, while maintaining client confidentiality and data security.
 - **Environment.** The report will review current governing statutes, as well as a brief peer review to determine program effectiveness in other locations.

Peer Review

Minnesota Experience

Minnesota's Department of Health (MDH) TB Prevention and Control Program has extensively researched issues surrounding TB and VDOT services. Their review has resulted in the creation of a variety of online resources, an analysis of technical options, and a legal review. These resources are a readily available source of information to help counties pursue VDOT options for TB.

Minnesota has not yet implemented VDOT programs to the extent that a handful of other states have, but recent state legislation will make future telemedicine efforts easier to pursue in Minnesota. The Minnesota Telemedicine Act (Minn. Stat. § 62A.672) is the most aggressive legislation in terms of addressing barriers to telemedicine. This legislation enables reimbursement for telemedicine activities in the same manner as other in-person health care activities.

Two county programs of note within Minnesota include Arrowhead and Stearns. Minnesota's Arrowhead Region, which includes seven counties in northeast Minnesota, utilizes the firm Vidyo for remote mental health services. Therapists are able to reach multiple clients across this largely rural area without the need for long-distance travel. Stearns County, which has TB rates similar to those in Dakota County, is actively pursuing the use of VDOT services through a pilot program with Minnesota IT Services (MN.IT).

In the event of language barriers arising during health care discussions, MDH provides a roster of available interpreters. Dakota County currently utilizes LanguageLine to address potential language barriers. These resources could be utilized for VDOT use.

Other Experience

Other states and counties have had extensive experience with VDOT services for TB. Some of the most notable examples are included below.

- Clark County, Washington (adjacent to Portland metro area)
 - Clark County has a similar population and TB rate (~12 TB clients/year) as Dakota County.
 - Clark County Public Health began utilizing VDOT in 2009 for TB clients.
 - Clients opting-in to VDOT were generally younger in age.
 - Completion rates were similar between in-person (2.5%) and VDOT (3.8%).
 - From 2009-2013, an estimated \$28,561 savings in program costs was realized (about \$2,000 per patient).
 - Overall, VDOT saved the county health department \$2,066 in mileage and staff time.
- Connecticut
 - Offers synchronous VDOT treatment, which does not save data and is HIPAA compliant.
 - The program utilizes VSee and FaceTime platforms.
 - A variety of resources are available including different programmatic steps for both patients and Public Health professionals. A sample eDot agreement is also available.

- Johnson County, Kansas (Kansas City metro area)
 - In 2015, Johnson County initiated VDOT services in response to a TB outbreak occurring within a high school. The outbreak occurred as the school year was ending, eliminating the convenient option of treating students daily in a centralized location as they attended school.
 - The response included both active and latent TB cases.
 - 15 of 27 eligible patients opted for VDOT treatment. 1 of the 15 had an adverse response to medication and discontinued treatment. All of the remaining 14 VDOT patients completed treatment.

- Harris County, Texas (Houston metro area)
 - In 2014, Harris County piloted their VDOT program.
 - The program was prompted by patient and health department concerns and costs, including inconvenience and travel.
 - Since its launch, 115 patients have participated in the program.

- Pierce and Snohomish Counties, Washington (Seattle metro area)
 - In 2010, a review was conducted of 57 patients in Pierce and Snohomish counties, who utilized VDOT at some point during a five year period (2002-2006).
 - The average time to review a patient video was just over five minutes.
 - In total, 2,994 hours of staff time and 103,632 driving miles were saved during that five year period.
 - There was an average savings of \$2,448 per patient.

These programs represent a greater trend in the United States toward an increased provision of telemedicine services. Over 15 million Americans received remote medical care in 2015, with an anticipated growth of 30% in 2016. Virtual doctor visits were expected to increase from 1 million in 2015 to 1.2 million in 2016.^v A wide range of services are common in telemedicine including outpatient visits, psychotherapy, and wellness visits.^{vi}

The expanding use of telemedicine is not limited to the United States. Telemedicine has tremendous potential in areas of the world where disease is common and health infrastructure is lacking.^{vii} Worldwide, telemedicine is projected to grow at a compound annual rate of 14.3 percent through 2020.^{viii} This rapid growth rate is consistent with projections of growth from 350,000 worldwide patient users in 2013 to 7 million users in 2018.^{ix}

Cost-Benefit Analysis

Summary of Key Cost-Benefit Findings

Estimates of the monetary savings of Dakota County implementing a VDOT option in 2018 are provided below for several different scenarios.

Scenario Description	# of DOT clients	# clients in VDOT	Cost savings with VDOT	
			<i>Per Client</i>	<i>Overall</i>
Low client #s; low participation	5	1	\$3,905	\$3,905
Low client #s; mid participation	5	3	\$3,030	\$9,091
Low client #s; high participation	5	4	\$2,921	\$11,684
Mid client #s; low participation	10	2	\$1,953	\$3,905
Mid client #s; mid participation	10	6	\$1,515	\$9,091
Mid client #s; high participation	10	8	\$1,461	\$11,684
High client #s; low participation	15	3	\$1,302	\$3,905
High client #s; mid-participation	15	9	\$1,010	\$9,091
High client #s; high participation	15	12	\$974	\$11,684

- Participation estimates. 60% was selected as our mid-participation rate (rather than 50%) as 67% of survey respondents expressed an interest in utilizing VDOT. 20% and 80% were used for the high and low participation rates.
- Client number estimates. 10 was selected as our mid-DOT client estimate as it is the average annual client number from 2013 to 2016. 15 and 5 were used as the high and low rates as they are close to the extremes of annual client numbers during that four-year period.

Per client cost estimates in our range are in line with estimates of per patient savings (\$2,448) found in the previously mentioned study of VDOT for TB in Pierce and Snohomish Counties in Washington State.^x

Cost-Benefit Analysis: Assumptions, Inclusions, and Calculations

The analysis assumes the following items.

- The first month of patient DOT visits will be done in-person prior to initiating VDOT. These were excluded from DOT and VDOT cost estimates for each client. 21.75 was used as the average number of workdays per month.
- One visit a week will be a Case Management visit by a Public Health Nurse (PHN). As this is universal, regardless of whether the client was using traditional DOT or VDOT, one visit a week for all clients was excluded as there was no change in cost.
- Based off Public Health staff estimates, it was assumed that 60% of DOT visits are completed by Community Health Workers (CHWs) and 40% are completed by a PHN.
- It was assumed that recordings of all VDOT visits will be viewed by a PHN. This shift of hours from the CHW to PHN explains why although the overall cost savings increases as the number of clients increase in each scenario, the savings per client decreases with each additional client participating in VDOT.
- Reduction in CHW and PHN time required for DOT was converted to cost savings. In reality, this savings will be seen in time available for those staff to complete other job duties, rather than a monetary savings. CHW and PHN salaries at the start of the 2017 Q2 range were used in these

estimates; additional costs such as County responsibilities for employee retirement and health insurance premiums are not included; and no FTE reductions are considered in this analysis. Using the start of the Q2 range is a conservative estimate, given feedback regarding minimal staff turnover in recent years.

- Based on Public Health staff estimates, 25 minutes was used as the average length of time to complete a face-to-face DOT visit, and ten minutes was used as the average length of time anticipated to complete viewing and documentation of a VDOT visit.
- Average roundtrip drive time and associated mileage costs were estimated using the past four years of TB DOT client addresses and the 2017 mileage reimbursement rate.
- In order to give as complete an overall program cost estimate as possible, items below that were a part of a BIP funding request were included in our calculations and treated as annual costs when we calculated estimated savings in the table on the previous page.
 - \$2,400 estimated cost of service plan (2 phones, each with 12 months of service at \$100 each/month);
 - \$1,800 annual estimated cost of software. Depending on software selection, this cost may actually be \$0, but the potential cost was included to maintain a conservative estimate; and
 - \$400 cost of phones, using the BIP line item of \$1,200 for phones and assuming this \$1,200 is really a recurring cost every three years.

Non-monetary costs and benefits

There are also a number of potential non-monetary benefits, as well as non-monetary costs and risks that are worth mentioning.

Costs and risks:

- Although it will be an opt-in program with an initial couple of months of face-to-face visits to get to know the client and ongoing weekly Case Management visits, there may be a loss of some trust and rapport built between the client and Dakota County staff member. In order to minimize this concern, clients would be able to request having the method of DOT return to daily in-person visits at any time.
- Although weekly case management visits with VDOT patients will continue throughout treatment, in order to minimize risk, Public Health Staff should instruct patients to look for symptoms/side effects associated with the most common and potentially severe reactions to TB medications and instruct them about what to do if they occur.
- Legal and ethical issues around data security, privacy, and HIPAA compliance are always a concern when patient private health data is being transmitted. The recommended video solution, Vidyo, is HIPAA-compliant, with secure storage and transmittal of patient recordings.

Benefits:

- Increased privacy to clients and their families, with the eliminated need for a daily Public Health staff visit.
- Client would experience less disruption to their work and home schedules and create the ability to take their daily medication at a consistent time that works best for their schedule.
- Reduced travel risk to County staff in visiting multiple sights on a daily basis. It also eliminates the need to travel in potentially hazardous conditions, such as snowstorms.
- County employees would no longer experience the potential risk of entering client residences.
- Increased preparedness and flexibility in responding to public health events. Experience utilizing VDOT may provide Dakota County Public Health with options to respond to unforeseen outbreaks, such as the TB outbreak in a high school in Kansas.^{xi}

Impact on Reimbursement

The Minnesota Department of Human Services (DHS) has indicated that billing for telemedicine services such as VDOT can be conducted at the same rates as in-person home visits. As a result, Dakota County implementation of a VDOT would not result in a decreased rate of reimbursement.

Client Survey

Summary of Key Survey Findings

- Strong Interest in VDOT – 67% of survey respondents would “Likely” use VDOT service.
- Limited Case Management – 73% of respondents did not view once-per-week case management as a barrier.

Items for Future Consideration

Several items should remain as topics for future discussion, but should not prevent Dakota County’s pursuit of VDOT service. Topics for future consideration include age, internet access, language barriers, and availability of County-provided phones.

Survey Implementation

In May and June 2017, Public Health staff surveyed past and present TB clients regarding their potential use of VDOT. At the time the survey began there was only one client being treated for TB. The survey was therefore expanded to include past clients who received TB related home visits within the past two years (January 2015 to June 2017).

This expanded timeframe was intended to increase the number of clients in the survey, while also ensuring that clients were not asked to provide a long-term recollection of their care experience. The survey was given to 29 client households, one of which had both a child and adult with TB. A full copy of the Tuberculosis Client Survey and its results are located in Appendices B and C.

Summary of Survey Responses

A total of 15 surveys were returned, which represents 52% of the households surveyed. The following summary highlights key survey findings.

- **Preferred Treatment Time.** Every client answering the question about preferred time for treatment expressed interest in receiving treatment between 8AM and 5PM. Two individuals did not answer this survey question.
- **Likelihood of Using VDOT Service.** 67% of respondents (10 out of 15) indicated that they would be either “Very Likely” or “Somewhat Likely” to utilize the VDOT service. Two of the five clients who were “Unlikely” to utilize the service were uncomfortable utilizing technology.
- **Phone Preference.** Of the ten clients who indicated that they would “Likely” use VDOT, six indicated that they would like to use their own phone and three preferred use of a County owned phone.
- **Internet Access.** 87% of survey respondents (13 out of 15) have regular internet access.
- **Once-Per-Week Case Management.** 73% of survey respondents (11 out of 15) indicated that seeing a Public Health Nurse once-per-week for case management would not negatively impact tuberculosis care.

Technical Options/Considerations

Criteria for Potential Service Providers

After reviewing potential options for VDOT services, Dakota County established the following minimum criteria, which includes internet based service, available on Android and Apple platforms, encryption of data, as well as store-and-forward (asynchronous) service.

- **Internet based.** Utilizing technology limited to landline phones would be prohibitive for individuals who primarily utilize cell phones. Also, the wide spread availability of free Wi-Fi internet access makes an internet-based service more practical.
- **Availability on Android and Apple.** Of the products reviewed all offered service to both Android and Apple devices. As a result, solutions would be able to serve customers regardless of their phones or service providers.
- **Encryption.** In order to help ensure patient confidentiality and the protection of data, the options reviewed provide data encryption services. This level of security will assist in the conveyance of information securely between the client and Dakota County and in ensuring HIPPA compliance.
- **Store-and-forward (asynchronous).** Ensuring client and staff convenience is a key benefit in offering a VDOT option. The best means for providing that convenience is store-and-forward (asynchronous) service, where clients determine a consistent daily time for recording themselves taking medication and upload the video for later viewing by a Public Health Nurse.

Partnership with the State of Minnesota

Minnesota's Department of Health (MDH) TB Prevention and Control Program and MN.IT have partnered to offer counties access to VDOT services through a pilot program. Through the program, the State of Minnesota is utilizing the VDOT provider Vidyo. Vidyo is a company active in providing other VDOT medical services, including the previously mentioned Arrowhead Mental Health services program. Also noted before, Stearns County has expressed an interest in the pilot program. The terms for participation in the proposed program are detailed in the Draft Joint Powers Agreement (Appendix E).

Partnering with the State of Minnesota would eliminate the need for Dakota County to separately sign a contract with Vidyo for VDOT services. Vidyo also satisfies the essential criteria previously highlighted for Dakota County VDOT services.

Participation within the State of Minnesota program would both satisfy the criteria for VDOT services and eliminate annual service fees, which would be absorbed by the State of Minnesota through their contract with Vidyo. The remaining costs for Dakota County would be limited to staff time and providing clients with a county-provided phone, when necessary.

Additional Service Providers

As research was undertaken for this report, it was not certain that a final agreement could be reached with the State of Minnesota for Dakota County to utilize Vidyo for VDOT. As a result, OPA staff explored other telemedicine options. Utilizing Vidyo via partnership with the State of Minnesota is recommended. If that is not possible, of the other three options outlined below, SureAdhere is the recommended alternative.

In January 2016, the Minnesota Department of Health's (MDH) Tuberculosis Prevention and Control Program evaluated a variety of technical options for providing VDOT.^{xii} A total of ten video conferencing options were reviewed. Only three (AiCure, emocha, and SureAdhere) satisfied all of the criteria desired by Dakota County. Note that in 2016, MDH did not review Vidyo's services.

The three firms reviewed can all satisfy the desired criteria for VDOT services, but each has unique features and limitations.

- **SureAdhere.** Based in California, SureAdhere provides VDOT services to communities across seven states, as well as services to four non-US countries. Similar to emocha, a July 2017 quote reflects the following annual costs.

Year 1 - \$7,000+ (includes a \$1,000 one-time training fee, plus travel expenses)

Year 2 forward - \$6,000, annually.

SureAdhere's above costs are based on a one-year contract. If based on a two-year contract, the per client fee drops to \$36 per month from \$50 per month. The two-year contract costs are summarized below.

Year 1 - \$5,320+ (includes a \$1,000 one-time training fee, plus travel expenses)

Year 2 forward - \$4,320, annually.

- **emocha.** Developed through Johns Hopkins, emocha Mobile Health Inc. provides VDOT services for Baltimore, MD and Harris County, TX. emocha provides HIPAA-compliant, cloud-based hosting of uploaded videos. A recent request for an updated quote from emocha was unanswered, but based on a May 2016 quote, the annual cost for service for ten patients was as follows.

Year 1 – \$7,070 (includes a \$900 one-time training and configuration cost)

Year 2 forward – \$6,170, annually.

emocha's annual costs include a \$290 web subscription fee.

- **AiCure.** Based in New York City, AiCure offers a unique facial recognition feature, which would eliminate the need for Public Health video review. Unfortunately, AiCure does not have a proven track record in providing VDOT services to municipalities. As a result of this lack of references, quotes were not pursued for AiCure's VDOT product.

Dakota County Provided Phones

In order to ensure equity in client access to VDOT services, Dakota County has proposed loaning phones to interested VDOT participants who do not have, or do not want to use, their personal phone. Based on the client survey results, less than 4 out of 10 clients interested in using VDOT services would opt for a Dakota County phone.

The phones would be intended for VDOT purposes only and clients would be required to sign a Client Device Loaner Agreement (Appendix F), which places the responsibility for non-VDOT related phone use

on the client. Cost for the client phones is estimated at \$200 each (a total of \$400 for two phones) and \$100 per phone per month in service charges (\$2,400 total per year).

Client phones would be set up through Dakota County using generic users (i.e. "Client 1," "Client2," etc.). The Public Health worker facilitating client treatment would then be responsible for the phone in terms of initial delivery to the client and collection upon completion of the program. Prior to delivery Dakota County's IT department will restrict the phone's capabilities to reduce the potential for unintended usage.

Appendix A – Project Scope



03/28/17
Final

Tuberculosis Video DOT Project

Project Scope Statement

**Prepared by: Office of Performance and Analysis (OPA) and
Information Technology (IT)**

Project Background (WHY)

History

The Dakota County Public Health Disease Prevention & Control Unit provides case management for clients with active Tuberculosis (TB). Public Health Nurses and Community Health Workers make daily visits to client with active TB to ensure clients have successful treatment of TB, which typically involves 9 to 12 months of multi-drug therapy. This daily delivery of medications (up to 10 pills) is called Directly Observed Therapy (DOT) and is the standard of care for patients with active TB.

Based upon home visiting data from 2014-16, Dakota County Disease Prevention staff conducted an average of 129 active TB home visits per month. However, the caseload can range widely, and has ranged from 67 to 256 visits per month.

Need for project

Daily Directly Observed Therapy in-person visits can place a burden on the schedules and privacy of some active TB patients. Additionally, in-person visits require staff travel time and mileage. The County, and clients with active TB, need a less invasive and more efficient option to provide DOT services.

Purpose/Deliverables/Outcomes (WHAT)

Statement of Purpose

The purpose of this project is to: review the video DOT model, evaluate client interest in participating in video DOT, provide an analysis of estimated costs and benefits (tangible and intangible) related to potential video DOT implementation by Dakota County, summarize program options and video DOT experiences by other jurisdictions, and to provide recommendations related to potential implementation of video DOT for clients with active TB.

Deliverables and format

OPA will research the issue and provide a brief memorandum overviewing the program's anticipated costs, benefits, and next steps.

Parameters (inclusion/exclusion)

Included – Review project costs and benefits (tangible and intangible).

Included – Survey program clients regarding potential interest in the program.

Included – Summarization of program options and procedures / consent forms in need of updates.

Included – Review of experiences in peer jurisdictions outside of Minnesota that have implemented a similar program.

Included – Creation (but not implementation) of a survey to follow-up with TB clients several months after a video DOT option were put in place.

Excluded – Coordinating the program's legal or technical review.

Excluded – Drafting purchasing documents related to program cell phone purchases.

Excluded – Drafting updated procedures and consent forms related to program implementation.

Success measure

The project will be successful if it provides a program overview that is useful in the review and implementation of the TB Video DOT concept.

Ultimate Project Goal

This project will provide a brief overview and analysis of the proposed program, in order to aid in potential TB video DOT implementation.

Process/Methodology (HOW)*Guiding questions*

What degree of client usage is anticipated for the proposed program?

What primary benefits would clients experience from program participation?

What is the best estimate for staff time saved through implementation of the program?

Methodology

- Tangible cost (program expense) / benefit (employee time and mileage savings) analysis
- Intangible cost (altered client interaction) / benefit (improved client experience) analysis
- Brief summarization of current / proposed Public Health nurse TB treatment interactions
- Brief time review of Public Health nurse TB treatment visits
- Survey of total current population of TB treatment clients (survey administered directly during TB site visits) with feedback to be compiled by OPA

Project Team and Audience (WHO)*Project Sponsor*

Christine Lees, Public Health Supervisor

OPA Project Manager/Staff

Josh Hill, Management Analyst

Dave Paulsen, Management Analyst

Team Members/Stakeholders
 Public Health TB nurses
 TB clients - as survey participants

Expected Audience (beyond project sponsor)
 Public Health Department staff
 Other Public Health Departments

Timeline (WHEN)

Task	Staff	Hours	Timeline
Develop TB client survey	OPA/PH	3	Early March 2017
Administer TB client survey	PH nurses	10	April-May
OPA review of TB program costs and staff time allotment	OPA/PH	20	April
OPA summarization of options and necessary procedure/consent updates	OPA/PH	20	April
Compile and summarize survey results	OPA	4	April
Draft and submit report	OPA	24	May
Update procedures and contracts	PH		March-May
Finalize contract with third party	PH		June-July
DHS consideration and approval	DHS		July-August
Purchase two phones	PH		August-September
Launch pilot program	PH		September 2017

Appendix B – Tuberculosis Client Survey (May-June 2017)

Dakota County is considering using the internet to view Tuberculosis (TB) treatments. Patients would record themselves taking medication on a phone or tablet and a nurse would view the video at a later time. Nurses would still make weekly visits to provide future medication and answer any questions. Your answers will help us decide if this option should be offered.

1) If you could take your TB medication anytime during the day, what time would you choose?

Midnight-8AM 8AM-5PM 5PM-Midnight

2) If you could use a phone or tablet to record yourself taking TB medicine, rather than having someone visit you in-person to take your medications, how likely would you be to choose that option?

Very Unlikely Somewhat Unlikely Somewhat Likely Very Likely

If you answered “Very Unlikely” or “Somewhat Unlikely,” please explain why?

3) If Dakota County provided a phone that could only be used for recording your taking of medication, would you prefer to use your own phone or a Dakota County issued phone?

Your Phone Dakota County Phone I do not want to record my taking of medication

4) Do you have regular internet access?

Yes No Unsure

5) Are you concerned that seeing someone only once a week for case management, instead of daily, will impact your TB care?

Yes No Unsure

If you answered “No” or “Unsure,” please explain why?

6) Do you have any other suggestions regarding the proposed recording of TB treatments?

Appendix C – Client Survey Results

The following information summarizes client survey results for the 15 TB clients who responded to the survey in May and June 2017.

1) If you could take your TB medication anytime during the day, what time would you choose?

Midnight-8AM	0% (0 count)
8AM-5PM	87% (13)
5PM-Midnight	0% (0)
No Response	13% (2)

2) If you could use a phone or tablet to record yourself taking TB medicine, rather than having someone visit you in-person to take your medications, how likely would you be to choose that option?

Very Likely	60% (9 count)
Somewhat/Very Likely	7% (1)
Somewhat Likely	0% (0)
Somewhat Unlikely	7% (1)
Very Unlikely	27% (4)

3) If Dakota County provided a phone that could only be used for recording your taking of medication, would you prefer to use your own phone or a Dakota County issued phone?

Your Phone	40% (6 count)
Dakota County Phone	20% (3)
Either	7% (1)
Not Interested	33% (5)

4) Do you have regular internet access?

Yes	87% (13 count)
No	7% (1)
Unsure	7% (1)

5) Are you concerned that seeing someone only once a week for case management, instead of daily, will impact your TB care?

Yes	13% (2 count)
No	73% (11)
Unsure	7% (1)
No Response	7% (1)

Appendix D – Draft TB Client Follow-Up Survey (after 6 months of VDOT)

Thank you for participating in Dakota County’s video observation of Tuberculosis (TB) treatments. Dakota County is interested in your experience.

1) What type of device did you use to participate?

Your Phone Dakota County Phone

2) Were you satisfied using this device to participate?

Satisfied Somewhat Satisfied Somewhat Unsatisfied Unsatisfied

If you answered “Unsatisfied” or “Somewhat Unsatisfied,” please explain why?

3) If you had another chance to make your decision regarding participation, would you participate again?

Yes No Unsure

If you answered “No” or “Unsure,” please explain why?

4) Did seeing a Public Health Nurse only once-per-week impact your level of care?

Yes No Unsure

If you answered “Yes” or “Unsure,” please explain why?

5) Do you have any suggestions regarding the TB video treatment program?

Appendix E – Draft Joint Powers Agreement

JOINT POWERS AGREEMENT

This agreement is between the State of Minnesota, acting through Minnesota IT Services (“MNIT”), and Dakota County Public Health Disease Prevention and Control Unit (“Dakota County”).

Recitals

Under Minn. Stat. § 471.59, subd. 10, the State is empowered to engage such assistance as deemed necessary. The State is in need Active Tuberculosis case management services.

Agreement

1 Term of Agreement

- 1.1 **Effective date:** June 1, 2017, or the date Dakota County obtains all required signatures under Minnesota Statutes Section 16C.05, subdivision 2, whichever is later.
- 1.2 **Expiration date:** May 30, 2019, or until all obligations have been satisfactorily fulfilled, whichever occurs first. Dakota County, DHS, and MNIT may extend this agreement by amendment for three one-year terms if mutually agreed between parties.

2 Agreement between the Parties

Dakota County will:

- 2.1 Provide nursing case management services to clients with Active Tuberculosis (TB) in Dakota County that meet all the recommended TB treatment standards and guidelines set forth by the Centers for Disease Control (CDC) and Minnesota Department of Health (MDH), as referenced in Exhibit X: Dakota County Public Health Policy #3301 TB Screening, Treatment and Case Management.
- 2.2 Conduct Daily Observed Therapy (DOT) to clients with Active TB, which may be provided in-person or through use of video DOT (VDOT), to ensure clients have successfully completed treatment of TB.
- 2.3 Determine TB client eligibility for video DOT based on Dakota County policy, as referenced in Exhibit X.
- 2.4 Obtain and securely store consent, as found in Exhibit Y: Client Consent for VDOT Therapy, for VDOT services from clients before initiating VDOT therapy, as referenced in Exhibit X.
- 2.5 Assess if clients are able to use their own devices or if clients will need a Dakota County device to assist them with accessing the Vidyo internet site.
- 2.6 Obtain a signed loan agreement from the client, as referenced in Exhibit Z: VDOT Loan Agreement.
- 2.7 Train clients on correct procedures for recording themselves taking medications and how to correctly use the Vidyo service.
- 2.8 Assess and monitor clients’ ability to demonstrate VDOT and provide ongoing education as needed to ensure medications are administered in compliance Dakota County procedures.
- 2.9 Dakota County Public Health Nurses will review videos daily that are stored in the Vidyo system and complete required documentation of the DOT in Public Health Documentation System (PH-DOC).
- 2.10 Provide all needed hardware for Vidyo service for Dakota County staff.
- 2.11 Provide internet service for staff to access the Vidyo technology.
- 2.12 Work with MNIT staff to provide feedback and evaluation of the Vidyo technology for VDOT purposes.

MNIT will:

- 2.13 Provide access to the Vidyo platform, including access log-ins and passwords for use of the Vidyo service by Dakota County staff and clients as needed.
- 2.14 Ensure accounts created meet all federal, state and Dakota County data privacy requirements.
- 2.15 Provide ongoing technical assistance to Dakota County staff as needed.

DHS will:

- 2.16 Maintain a contract for Vidyo to provide telemedicine services.
- 2.17 Continue to work with Dakota County for delivery of the Vidyo services for telemedicine.

3 Payment

Each party will be responsible for the costs it accrues while maintaining its portion of the contract.

4 Assignment, Amendments, Waiver, and Contract Complete

- 4.1 **Assignment.** No party to this contract may either assign or transfer any rights or obligations under this agreement without the written consent of the other parties and a fully executed Assignment Agreement, executed and approved by the same parties who executed and approved the original agreement, or their successors in office.
- 4.2 **Amendments.** Any amendments to this agreement must be in writing and will not be effective until it has been executed and approved by the same parties who executed and approved the original agreement.
- 4.3 **Waiver.** If any party fails to enforce any provision of this agreement, that failure does not waive the provision or its right to enforce it.
- 4.4 **Contract Complete.** This agreement contains all negotiations and agreements between Dakota County, DHS and MNIT. No other understanding regarding this agreement, whether written or oral, may be used to bind either party.

5 Liability

Each party will be responsible for its own acts and behavior and the results thereof.

6 Government Data Practices

Dakota County, DHS and MNIT must comply with the Minnesota Government Data Practices Act, Minn. Stat. Ch. 13, as it applies to all data provided by the State under this agreement, and as it applies to all data created, collected, received, stored, used, maintained, or disseminated by Dakota County under this agreement. The civil remedies of Minn. Stat. § 13.08 apply to the release of the data referred to in this clause by either Dakota County, DHS or MNIT.

7 Termination

- 7.1 **Termination with cause.** Dakota County, DHS or MNIT may terminate this agreement at any time, with cause, upon 30 days written notice to the other parties.
- 7.2 **Termination without cause.** Dakota County, DHS or MNIT may terminate this agreement at any time, without cause, upon 90 days written notice to the other parties.

IN WITNESS WHEREOF, the parties hereto have executed this Contract on the date(s) indicated below.

Approved by Dakota County Board

Resolution No. _____

COUNTY OF DAKOTA

By _____

Title Community Services Director

Date of Signature _____

MNIT
(I represent and warrant that I am authorized by law to execute this Contract).

By _____

(Please print name.)

Title _____

Date of Signature _____

Appendix F – Client Device Loaner Agreement

LOANER AGREEMENT FOR VIDEO DIRECTLY OBSERVED THERAPY (VDOT) DEVICE

Client Name: _____ Date of Birth: ___ / ___ / ___
Device (Phone/Tablet/Computer) Type: _____ Device Number: _____
Date Device Received: ___ / ___ / ___ Expected Date of Return: ___ / ___ / ___

Unacceptable use: It is impossible to list every example of acceptable and unacceptable use of the device. Dakota County Public Health will decide whether uses that are not listed are unacceptable. Unacceptable uses include, but are not limited to:

- Engaging in illegal or offensive online activity such as sending or receiving abusive, pornographic, sexually explicit, violent, or threatening material.
- Sending or receiving of material that violates state or federal laws is not allowed. This includes, but is not limited to, confidential information, copyrighted material, online piracy, and threatening material.
- Trying to change the default settings or security settings of the device.
- Trying to introduce harmful code such as viruses, worms, spyware, malware, adware, or keyloggers.

I agree to the statements below:

- I received a device and accessories to use for my Video Directly Observed Therapy (VDOT). The device and its accessories are in good working order and came with all software needed.
- A Dakota County Public Health worker explained to me how to use the device and acceptable use of the device. I understand what we discussed.
- I will take all reasonable steps to keep the device and its accessories safe and working.
- I will:
 - Not loan the device to others.
 - Protect the device from extreme temperatures.
 - Keep the device away from food or drink.
 - Use the protective case and sleeve and take care to not damage the screen.
 - Never leave the device in an unsecured area or visible in a locked or unlocked vehicle.
 - Not share passwords with unapproved persons.
- If the device or its accessories are lost or damaged, I may be responsible for the cost of repair or replacement.
- I am responsible for using good judgment about acceptable use of the device and I am responsible for any additional software, apps, or other files loaded onto it.
- I know that Dakota County Public Health can access the device remotely for security purposes.
- I am expected to return the device and its accessories at the end of my tuberculosis treatment or upon request from Dakota County Public Health.

I will call Dakota County Public Health at 952-891-7500 if I have any questions or problems with this device or its accessories.

Signature of Client / Legal Representative

___ / ___ / ___
Date

Signature of Dakota County Public Health Staff

___ / ___ / ___
Date

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- ⁱ Minnesota Department of Health, “Video Directly Observed Therapy (VDOT) – A Minnesota Perspective,” January 2016.
- ⁱⁱ Centers for Disease Control and Prevention (CDC), “Trends in Tuberculosis, 2015” fact sheet.
- ⁱⁱⁱ Minnesota Department of Health, “Video Directly Observed Therapy (VDOT) – A Minnesota Perspective,” January 2016.
- ^{iv} Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, “Implementing an Electronic Directly Observed Therapy (eDOT) Program: A Toolkit for Tuberculosis (TB) Programs,” page 3, no date provided.
- ^v Melinda Beck, The Wall Street Journal, “How Telemedicine is Transforming Health Care,” June 2016.
- ^{vi} U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, “Telehealth Services,” November 2016.
- ^{vii} Eccles, Nora, Harvard College Global Health Review, “Telemedicine in Developing Countries: Challenges and Successes,” February 2012.
- ^{viii} Foley & Lardner LLP, “Five Telemedicine Trends Transforming Health Care in 2016,” November 2015.
- ^{ix} IHS Technology, “Global Telehealth Market Set to Expand Tenfold by 2018,” January 2014.
- ^x Krueger, K., et al, “Videophone utilization as an alternative to directly observed therapy for tuberculosis (Pierce and Snohomish counties, WA),” 2010.
- ^{xi} Johnson County, Kansas, “Information about TB infection cases at Olathe Northwest High School,” www.jocogov.org.
- ^{xii} Minnesota Department of Health’s (MDH) Tuberculosis Prevention and Control Program, “Technological Options for Video Directly Observed Therapy (VDOT),” January 2016.