Building Bridges:
Innovation in Telemedicine Use for the Provision of Reproductive Health Care

Thanks to advances in science and technology, accessing reproductive health care should be easier than ever. Yet legal, political, and economic barriers currently place medically unnecessary roadblocks in the way. The repercussions are troubling: Nearly half of all pregnancies in the United States (U.S.) are unintended,¹ the U.S. is the only developed nation with maternal mortality on the rise,² nearly 20 million new sexually transmitted infections occur every year in this country,³ and 18-35% of Medicaid-eligible women seeking abortion cannot access the care they need and are forced to carry their pregnancy to term.⁴

Fortunately, innovative solutions in service delivery can address some of the barriers to access and thereby ameliorate some of the above-mentioned concerns. One such innovation is telemedicine. This technology – accelerating in many other areas of health care – has applications for contraception, abortion, prenatal, and sexual health services. An uptake in telemedicine use in the realm of reproductive health care could have a major impact on reproductive health outcomes, producing significant improvements in the health and well-being of individuals and families.

Telemedicine is defined as the use of telecommunications technology to deliver health services to patients remotely and to facilitate information exchange among health care providers, as well as between providers and patients. Telemedicine can take a number of forms. It can include video chatting with a provider from the comfort of the patient’s home, receiving medical care over the phone rather than in person, or visiting a local doctor’s office and using telecommunications to bring a third provider (such as a specialist) into the room virtually. While telemedicine involves only the provision of clinical care, the closely related term “telehealth” refers to the provision of both clinical and non-clinical care (such as patient and public health education, provider training, and medical education).⁵ This paper focuses only on the use of telemedicine and solely in the context of reproductive health care.

The American Telemedicine Association (ATA) reports that use of telemedicine dates back 40 years and is widely employed throughout the world in various medical fields. There are currently about 200 telemedicine networks with 3,000 service sites in the U.S.⁶ More than half of all U.S. hospitals use telemedicine and millions of individuals access telemedicine services across the globe.⁷ Some of the many benefits of telemedicine include increased access and convenience for patients; improved quality

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of care; and reduced costs “through better management of chronic diseases, shared health professional staffing, reduced travel times, and fewer or shorter hospital stays.”

While access to all health care can be challenging, access to reproductive health care can be especially burdensome due to:

- Stigma around sexuality and reproduction;
- Ideologically-based legal restrictions singling out reproductive health care;
- Distance to service points caused by the forced shutdowns of reproductive health clinics;
- Cost and lack of insurance coverage of reproductive health care;
- A shortage of providers due to a lack of training opportunities, as well as harassment and violence against them; and
- Misinformation about sexual and reproductive health resulting from a lack of comprehensive sex education.

The combination of these factors has led to system-wide barriers to reproductive health care in the U.S., but an uptake in the use of telemedicine could help meet the needs of individuals struggling to access care.

Reproductive health care is an indispensable component of a person’s overall medical well-being. Not only can it prevent disease and other medical complications, but it can also empower individuals to participate more fully in society. Reproductive health care allows families to plan the spacing of their pregnancies, facilitates educational and employment opportunities by deferring pregnancy until a later time, helps foster safe and healthy relationships, improves health and developmental outcomes for infants, and more. The importance of access to reproductive health care cannot be overstated and the use of telemedicine in this arena should be celebrated by the telemedicine community as a promising area for greater expansion. This paper outlines some of the many ways in which telemedicine is already being used to make accessing reproductive health care more convenient and suggests some areas for expansion to increase positive health outcomes.

**Contraception**

Thousands of Americans, especially those with fewer financial resources, struggle to access contraception for a myriad of reasons. These include lack of insurance coverage, confusion surrounding family planning due to a lack of comprehensive counseling and education, and the difficulty meeting the costs associated with traveling to and from a health care provider (as required for many methods of contraception). While nearly all American women aged 15-44 who have ever had sexual intercourse have used at least one contraceptive method, approximately half have not used contraception at times and/or used it inconsistently or incorrectly – placing them at high risk for unintended pregnancy. Indeed, 41% of the 3.1 million unintended pregnancies that occur each year are due to this inconsistent or incorrect use. Of U.S. women surveyed who had a gap in their use of contraception, 5% said their

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viii “What is Telemedicine?”


non-use was due to a lack of time for medical visits to get a method and 5% reported difficulties paying for a method.\textsuperscript{xii} Another survey found that 20% of women reported that the cost of a doctor’s visit was an obstacle to obtaining a prescription contraceptive.\textsuperscript{xiii} Telemedicine can remedy or reduce many of these reported barriers to access, such as lack of time for medical visits or inability to pay for the cost of and transportation to an in-person visit.

The internet and smartphones have revolutionized the manner in which people across the globe seek out and receive health information and care. In the realm of reproductive health care, where privacy and discretion can be of utmost importance, these technologies have paved the way for greater access to contraception, especially given that leading medical groups agree that pelvic and breast exams are not medically necessary for the initiation of hormonal contraception.\textsuperscript{xiv} Accordingly, providers have already begun to integrate these technologies into their practice.

Planned Parenthood, for instance, has designed a phone app called “Planned Parenthood Care,” which allows patients to use their smartphone to video conference with a provider, discuss their medical history, and then decide which method of contraception (the pill, patch, or vaginal ring) would be best for them.\textsuperscript{xv} Following the video conference, Planned Parenthood sends the selected method through the mail in discreet packaging. Alternatively, the patient may pick up the contraception at their local brick-and-mortar pharmacy.

This system is ideal for young people or others with privacy concerns, busy parents short on time, women in rural areas far from clinics, employees who would have difficulty taking time off from work, or individuals unable to travel. The program saves women not only the cost and time of having to travel to an in-person doctor’s appointment, but also the expenses of travel, which may include lost income, childcare, and transportation costs.

Other telemedicine platforms allow users to purchase contraception online without having to talk to a provider via phone or video. Nurx, for example, is a startup company offering contraception through its website or phone app to anyone in California or New York.\textsuperscript{xvi} Nurx offers users a choice between the pill, patch, and vaginal ring. To begin, users answer questions about their age, smoking habits, medical history, blood pressure, menstrual cycle, and pregnancy status in order to determine which method is best for them. The responses are subsequently forwarded to the company’s physicians, who review them for any contraindications or concerns (for instance, a progestin-only option rather than a product containing estrogen would likely be recommended for a woman with a history of venous thromboembolism, due to her increased risk of blood clots). If the physicians see no serious medical risks, Nurx sends the patient’s contraception in the mail overnight with no shipping costs. Moreover, patients can receive up to three months’ supply of their method at a time. Other companies that use a


\textsuperscript{xv} Currently, people in Hawaii, Washington, Idaho, Alaska, and Minnesota may use the app, although Planned Parenthood hopes to expand the pilot program into more states. “Hello. We’ll see you now,” Planned Parenthood Federation of America, accessed June 20, 2016, https://www.plannedparenthood.org/get-care/online/video-visit.

\textsuperscript{xvi} Nurx, https://app.nurx.co/.
similar model to prescribe contraception include Lemonaid Health, Maven, the Pill Club, and Project Ruby.

Because Nurx can provide automatic refills and renewals, the company eliminates the need for in-person doctor’s visits or pharmacy pickups. While Nurx would like to see the elimination of the prescription requirement for oral contraceptives altogether, its goal until that time comes is to get contraception into women’s hands as quickly as possible. In the future, Nurx hopes to utilize a courier service to deliver birth control to women’s doors within hours of submitting an order online.

In addition to routine contraception, telemedicine is an important option for the sale of emergency contraceptive pills, which can prevent pregnancy up to 72-120 hours after unprotected sex or contraceptive failure (depending on which type of emergency contraceptive pill is used). Emergency contraceptive pills come in two formulations: levonorgestrel (Plan B One-Step® and its generics) and ulipristal acetate (ella®). Both formulations are available for sale online, although Plan B One-Step® and its generics do not require a prescription while ella® does.

Afterpill.com is an affordable option for people who would like to order levonorgestrel emergency contraception ahead of time in order to be prepared for when they might need it. For $20, users can purchase a generic form of Plan B One-Step® and have it shipped to their home. Amazon.com is a better-known resource that sells Plan B One-Step® and its generics – often at a lower price than at retail outlets.

Since the emergency contraceptive ella® still requires a prescription, it can be purchased online after a simple screening and prescription from a remote medical provider. Kwikmed.com sells ella® with expedited shipping and as long as the provider does not identify any contraindications, the product is shipped to the customer’s home within one to three business days. Nurx currently offers ella® and Plan B One-Step® and Project Ruby offers both ella® and a generic version of Plan B One-Step®.

Abortion

Women face even greater obstacles in accessing abortion care and the obstacles are multiplying. In recent years, state legislatures have enacted record-breaking numbers of restrictions on abortion access, as anti-abortion politicians seek to erect financial and logistical barriers based on ideology rather than science. From 2011 through 2015, states enacted 288 abortion restrictions, almost as many as in the previous 15 years combined. And the trend does not show any signs of slowing. During the 2015

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xviii Ibid.

xix Emergency contraceptive pills containing the progestin hormone levonorgestrel are sold under several names, including Plan B One-Step®, Take Action®, My Way®, Next Choice One-Dose®, and others. They are available over-the-counter without age restrictions. Emergency contraceptive pills containing ulipristal acetate are available under the brand name ella® and are prescription only. Both formulations should be taken as soon as possible, but may be effective at preventing pregnancy up to five days (120 hours) after unprotected intercourse or contraceptive failure.


state legislative session, 46 states introduced a total of 396 proposed abortion restrictions.\textsuperscript{xxiv} The restrictions that became law have led to sudden abortion clinic closures, provider shortages, and sharp spikes in costs for patients and providers, making access to safe and legal abortion harder than ever.\textsuperscript{xxv} To make matters worse, eighteen states have banned the use of telemedicine for abortion\textsuperscript{xxvi} without any evidence-based justification for doing so.\textsuperscript{xxvii}

Clinic closures and provider shortages across the country mean that some women must travel hundreds or even thousands of miles to obtain the care they need. Such closures and shortages are often a result of targeted regulation of abortion provider (TRAP) laws, which force abortion clinics and providers to comply with medically unnecessary and financially destructive regulations based not on safety, but on ideologically motivated attempts to deter access.\textsuperscript{xxviii} TRAP laws include excessive construction requirements for clinics, such as unneeded requirements regarding hallway widths; mandates regarding the number of required parking spots;\textsuperscript{xxix} and requirements regarding the size of janitorial closets.\textsuperscript{xxx} Some TRAP laws impose onerous licensing fees not required in comparable medical fields.\textsuperscript{xxxi} Others require providers to have admitting privileges at local hospitals or clinics to be within a short distance of a hospital,\textsuperscript{xxii} despite the fact that abortion is one of the safest medical procedures available.\textsuperscript{xxiii} Still others limit the provision of abortion care only to physicians, excluding other medical care providers who are capable of safely performing abortions.\textsuperscript{xxiv}

As of 2011, 89% of all U.S. counties had no identifiable abortion provider.\textsuperscript{xxv} This is especially burdensome for low-income women, who may not have the resources to travel to a faraway provider; and for women in rural areas, where closures have made clinical care virtually nonexistent. In the Texas

\begin{itemize}
\item \textsuperscript{xxiv} ibid.
\item \textsuperscript{xxvi} Nash, “Laws Affecting Reproductive Health and Rights.”
\item \textsuperscript{xxviii} It should be noted that in June 2016, the U.S. Supreme Court decided the case of \textit{Whole Woman’s Health v. Hellerstedt} and found two types of Texas TRAP laws unconstitutional. The Court found the Texas law requiring (a) abortion providers to gain admitting privileges at local hospitals and (b) abortion clinics to meet the same hospital-like building standards as an ambulatory surgical center both unconstitutional, stating that they do not increase patient safety or care, yet have the effect of closing clinics and reducing access. \textit{Whole Woman’s Health v. Hellerstedt}, 579 U.S. _ (2016).
\item \textsuperscript{xxi} “Targeted Regulation of Abortion Providers (TRAP): Avoiding the TRAP,” Center for reproductive Rights, November 1, 2007, http://www.reproductiverights.org/node/611.
\end{itemize}
Within the U.S., states have placed numerous restrictions on the administration of medication abortion. Such restrictions, in conjunction with individual clinic procedures, determine when and how a woman is to take the mifepristone and misoprostol pills. Generally speaking, the protocol is as follows:

On the first visit, medical staff will confirm the patient’s pregnancy and determine how far along she is in her pregnancy (gestational age). A provider will also determine the patient’s Rh type as well as the pregnancy’s location to make sure it is not ectopic (a pregnancy located outside the uterus, usually in the fallopian tube). The patient and provider will review her medical history to ensure that she does not have any contraindications to the medications. If patient and provider decide to proceed, the provider will explain the procedure, answer any questions, and gain the patient’s informed consent. Next, the patient will take the first pill, mifepristone, at the office and the provider will give her the second set of pills, misoprostol pills, to take at home 24-48 hours later.

The patient must then have a follow-up assessment 7-14 days after taking the mifepristone. The purpose of this follow-up assessment is for the provider to confirm that the pregnancy has been terminated and to check for any complications that may have arisen.

The U.S. Food and Drug Administration (FDA) authorizes both physician and non-physician providers to dispense mifepristone and misoprostol. This is due to the overwhelming evidence that many non-physician clinicians (such as nurse practitioners, physician assistants, and certified nurse midwives) are just as capable of providing medication abortion as physicians. However, because of stringent and medically unnecessary FDA restrictions on mifepristone, it may only be dispensed by or under the supervision of a provider registered with Danco Laboratories, the manufacturer of Mifeprex®. While neither the FDA nor

Rio Grande Valley, for instance, there are 275,000 women of reproductive age, yet not a single abortion provider. Because of this depletion in abortion providers, Texas women must drive an average of 46 miles one-way to obtain an abortion.

In the face of abortion provider shortages and reproductive health clinic closures, the use of telemedicine for abortion care can help provide some relief. Although abortions can be safely and effectively performed in a number of ways, the two most common first trimester methods in the U.S. are aspiration abortion and medication abortion. Aspiration abortion refers to an abortion performed by a provider in their office or in a hospital with instruments that use suction to empty the uterus. Medication abortion, sometimes called medical abortion, refers to an abortion effectuated by taking a drug or combination of drugs, usually mifepristone (brand name Mifeprex®) and misoprostol (brand name Cytotec®). In some states, telemedicine is already being used to facilitate medication abortions, allowing providers to dispense the medication remotely.

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Danco limits registration solely to physicians, 37 states have banned non-physician clinicians from providing the pills\textsuperscript{d} (even under the supervision of a physician) in a purposeful effort to reduce access.

Because of these restrictions, medical offices that do not have a Danco-registered provider on-site have begun using telemedicine to provide medication abortions to their patients. The patient can visit the medical office to meet with a non-registered provider. This non-registered provider will confirm that the patient is pregnant, explain the procedure, answer questions, and gain the patient’s informed consent. If the patient decides to proceed, the non-registered provider then sends the patient’s information (including ultrasound images and the patient’s medical history) to a Danco-registered provider at a remote office. Next, the registered provider holds a video conference with the patient and the non-registered provider in order to further discuss the procedure. The registered provider then pushes a button that opens a drawer in the patient’s exam room containing the mifepristone and misoprostol pills. The patient takes the first pill during the video conference and receives instructions on how and when to take the second set of pills (usually at home, depending on her state).\textsuperscript{e} Given current restrictions on abortion providers, the use of telemedicine in this context greatly expands patient access to medication abortion, especially in the 37 states where only physicians are allowed to register with Danco.

Research demonstrates the acceptability of telemedicine abortions among patients. One study found that the use of telemedicine for abortion is just as effective and acceptable to patients as a face-to-face interaction with a physician.\textsuperscript{xli} In fact, 94% of the women in that study who chose telemedicine for their abortions said they were very satisfied with the encounter, compared with 88% of face-to-face patients.\textsuperscript{xlii} Telemedicine patients were more likely to recommend the procedure to a friend than were the face-to-face patients.\textsuperscript{xliii} With regard to safety, women who used telemedicine for their abortions had no more complications than those who did not use telemedicine.\textsuperscript{xliv}

Planned Parenthood of the Heartland, which serves Arkansas, Iowa, Nebraska, and eastern Oklahoma, launched the country’s first telemedicine abortion system in 2008 for use in Iowa.\textsuperscript{xlv} Between 2008 and 2015, the system enabled more than 7,200 Iowans to obtain medication abortion.\textsuperscript{xlvi} Use of telemedicine for general health care is relatively common in Iowa, particularly in rural communities where health care professionals with prescriptive authority are few and far between. A 2012 Ibis

\textsuperscript{\textsuperscript{d} Guttmacher Institute, “Medication Abortion,” State Policies in Brief, as of June 1, 2016, https://www.guttmacher.org/sites/default/files/state_policy_overview_files/spib_ma.pdf.}
\textsuperscript{\textsuperscript{e} 18 states require the patient to return to the abortion clinic center for the second pill instead of taking it at home. Ibid.}
\textsuperscript{\textsuperscript{xlii} Ibid.}
\textsuperscript{\textsuperscript{xliii} Ibid.}
\textsuperscript{\textsuperscript{xliv} Ibid.}
\textsuperscript{\textsuperscript{xlv} Despite evidence of telemedicine’s safety and efficacy in abortion provision, the Iowa Board of Medicine passed a regulation in 2013 that banned the use of telemedicine for medication abortion. The ban did not apply to any other type of health care. Planned Parenthood of the Heartland sued to invalidate the ban and in June 2015, the Iowa Supreme Court held that it was unconstitutional for the state to prevent physicians from using telemedicine to administer medication abortion when telemedicine was available for other kinds of medical care. Thus, telemedicine abortion is continuing in Iowa, providing safe and effective care to those who might otherwise not have access. 865 N.W.2d 252.}
\textsuperscript{\textsuperscript{xlvi} Samantha Lachman, “Iowa Supreme Court Strikes Down Telemedicine Abortion Ban,” Huffington Post, June 19, 2015, http://www.huffingtonpost.com/2015/06/19/iowa-abortion-ban_n_7621646.html.}
Reproductive Health study showed that Planned Parenthood’s introduction of telemedicine improved Iowans’ access to medication abortion by increasing the likelihood that women obtained an abortion before their thirteenth week of pregnancy.\(^\text{xviii}\) The results suggest that telemedicine alleviates barriers (such as cost, stigma, and scarcity of abortion providers) that can cause delays for a woman seeking an abortion until later in pregnancy. The ability of patients to access abortion services earlier in pregnancy is beneficial because earlier abortions are associated with lower costs and lower rates of complications.\(^\text{xliv}\) In addition to Iowa, clinics in Maine and Minnesota also offer medication abortion via telemedicine. Hawaii, New York, Oregon, and Washington have begun to pilot the use of telemedicine for abortion.\(^1\)

On top of a massive shortage of providers, there are other barriers to medication abortion. Currently within the U.S., and especially in abortion-hostile states, the process of obtaining a medication abortion can be a long, expensive, and drawn-out process involving numerous visits to an abortion clinic. Due to mandatory (but medically unnecessary) in-person counseling requirements, ultrasound mandates, and waiting periods, as well as requirements for in-person post-abortion follow-up visits, patients in many states must travel to the abortion clinic at least two times (sometimes three or four) to complete their medication abortion. For many women, especially low-income women and women in rural areas far from a clinic, these multiple-trip requirements can put the procedure financially and logistically out of reach. Taking time off work (often unpaid), paying for the costs of traveling to and from the clinic, arranging childcare, and securing hotel accommodations can add up to make the total out-of-pocket costs prohibitive. Indeed, women have reported these multiple-trip requirements as a reason for not selecting this method of abortion.\(^\text{lii}\)

Another way telemedicine can assist with medication abortion provision is to provide abortion follow-up care by telephone, which can reduce the number of in-person visits required. With medication abortion, a patient is required to have a follow-up assessment approximately 7-14 days after taking the first medication abortion pill (mifepristone). The purpose of the follow-up assessment is to confirm that the patient is no longer pregnant (usually using a transvaginal ultrasound and/or manual exam) and to screen for any complications. Although the FDA does not require that this follow-up happen in person, many clinics do follow up with patients in-person on a case-by-case basis, and many states unnecessarily require an across-the-board in-person follow-up visit by law.\(^\text{lii}\) Emerging research suggests, however, that this follow-up assessment can be conducted safely and effectively over the phone rather than in person.\(^\text{lii}\) In fact, a number of medical groups, such as the World Health Organization and the National


\(^{\text{xli}}\) Ibid.


\(^{\text{lii}}\) Guttmacher Institute, “Medication Abortion.”

\(^{\text{liii}}\) Liz Borkowski et al., “Medication Abortion: Overview of Research & Policy in the United States,” Bridging the Divide: A Project of the Jacobs Institute of Women’s Health, November 2015, http://publichealth.gwu.edu/sites/default/files/Medication_Abortion_white_paper.pdf (summarizing several studies assessing women’s ability to determine for themselves whether or not their pregnancy had been terminated after an abortion and examining the feasibility, acceptability, and efficacy of phone follow-up after early medication abortion).
Abortion Federation, list in-person follow-up after an abortion using mifepristone/misoprostol as a mere option, rather than a requirement.\textsuperscript{iv}

A woman can use methods other than ultrasound or manual examination to confirm that her pregnancy has been terminated, eliminating the need for an in-person follow-up. She could do so without having to return to the abortion provider by using a variety of simple tests, some of which can be done at home and some of which can be done at a lab or office close to her home.\textsuperscript{iv} Once she has confirmed that she is no longer pregnant, a provider can assess the need for additional follow-up over the phone. During the call, the provider can use a questionnaire or checklist to inquire about any lingering symptoms, including duration of heavy bleeding or ongoing symptoms of pregnancy.\textsuperscript{v} Only if the provider detects a concern would the patient need to return to the facility where she received the abortion.

Post-medication abortion telephone follow-up is already being used both inside and outside of the U.S. In the United Kingdom, for example, the abortion provider group Marie Stopes International offers women a choice between an in-person follow-up and telephone follow-up. 50% select the phone and have done so “without any apparent adverse outcomes or consequences.”\textsuperscript{viii} Within the U.S., some abortion providers are already testing the use of phone follow-up\textsuperscript{viii} and additional studies have been undertaken to obtain more data on safety and efficacy.\textsuperscript{ix}

While further research is needed on the feasibility of telephone follow-up after a medication abortion, it remains an exciting innovation that could save patients the time and resources of having to make a second, third, or fourth trip to the doctor’s office. Development of educational and counseling materials for patients to use at home to help determine whether their pregnancies have been successfully terminated, along with development of a telephone protocol to help guide providers, could be extremely useful in facilitating phone follow-up after medication abortion.\textsuperscript{x} Policy advocacy in this area should also continue to work toward the goal of lifting medically unnecessary bans on telemedicine for abortion care so that the full potential of telemedicine may be realized in the interest of reproductive health and dignity.


\textsuperscript{v} A number of alternative tests for confirmation of pregnancy termination have been developed that allow for follow-up without having to return to the abortion provider’s office (which might be hundreds of miles away). These methods measure the levels of human chorionic gonadrophin (hCG), a hormone produced during pregnancy, in a woman’s body. hCG can be measured through either a blood or a urine test. A serum hCG test requires a patient to have a blood test on the day she takes mifepristone and a second blood test for comparison about a week later. This second test can be done at a lab closer to the patient’s home. Alternatively, a woman’s hCG levels can be measured with a urine test. One option is an over-the-counter urine pregnancy test purchased from a pharmacy or retail store; another is a semi-quantitative pregnancy test (SQPT). SQPTs show the level of hCG that a woman has remaining in her body (compared to a standard urine pregnancy test, which can only detect the presence of hCG). One SQPT is performed at the provider’s office before the patient takes the mifepristone, then the patient takes a test a second time at home two weeks later for comparison. While SQPTs are currently being piloted in research studies at certain abortion clinics, they are not yet available for retail purchase.

\textsuperscript{vi} Borkowski et al., “Medication Abortion.”


\textsuperscript{viii} Borkowski et al., “Medication Abortion.”


Prenatal care

Nearly 4 million births occurred in the U.S. in 2014, \(^{64}\) highlighting a clear demand for quality pregnancy and prenatal care. Prenatal care is the medical care needed during pregnancy to ensure the health of both the pregnant person and fetus. It may include physical exams, weight checks, blood and imaging tests, ultrasounds, and discussion of any questions a patient may have. Women report many barriers to prenatal care, including “long wait times, the location and hours of the clinic, language and attitude of the clinic staff and provider, the cost of services, and the lack of child-friendly facilities.”\(^{65}\) In fact, in a U.S. Department of Health and Human Services report examining barriers to care, over 17% of recent mothers reported that they were not able to access prenatal care as early as they had wanted, with young women and women of color reporting the highest delays in accessing care. \(^{66}\) Approximately 38% of respondents reported that they could not get appointments when desired, 20% reported they were too busy, 14% lacked transportation to a clinic or doctor’s office, 10% could not take time off work or school, and 8% needed childcare in order to make it to their appointment. \(^{67}\) These responses indicate a clear need for more accessible, affordable, and convenient prenatal care.

Through its increased convenience for those who are busy or cannot afford to travel to the doctor, telemedicine can be utilized in countless ways to provide prenatal care, resulting in better pregnancy outcomes for the woman and fetus. The Antenatal Neonatal Guidelines, Education, and Learning System (ANGELS) network, based at the University of Arkansas (U of A), for instance, connects patients with neonatal, maternal, and fetal specialists they may not otherwise be able to consult. Women with high-risk pregnancies are able to receive a variety of services, including access to a 24/7 information hotline, virtual real-time medical consultations with specialists, and follow-up care. \(^{68}\)

When low-weight babies are able to access specialized care, a higher percentage of them will survive. \(^{69}\) This has been demonstrated by the ANGELS program. Thanks to the program’s ability to provide referrals for high-risk rural women, more low birthweight babies were delivered under the U of A’s specialized care after the program’s implementation than before. \(^{70}\) The proportion of low birthweight infants delivered at the U of A increased from 37.7 to 42.1%. \(^{71}\) As a result, the 60-day infant mortality rate was reduced by 0.5%. \(^{72}\)

The U of A is even using telemedicine to provide remote care to pregnant women incarcerated within the state. Prenatal care in U.S. prisons and jails is often poor quality or nonexistent and the Pulaski


\(^{67}\) Ibid.

\(^{68}\) Curtis Lowery et. al., “ANGELS and University of Arkansas for Medical Sciences Paradigm for Distant Obstetrical Care Delivery,” American Journal of Obstetrics and Gynecology 196, no. 6 (2007): 534.e1-.e9, http://dx.doi.org/10.1016/j.ajog.2007.01.027.

\(^{69}\) R. Whit Hall, Julie Hall-Barrow, and Edgar Garcia-Rill, “Neonatal Regionalization Through Telemedicine Using a Community-Based Research and Education Core Facility,” Ethnicity and Disease 20, no. 1 Suppl. 1 (2010): S1-136-40.

\(^{70}\) Ibid.


\(^{72}\) Ibid.
Pregnant women are also turning to their smartphones for convenient, personal, and reliable source of answers to the questions that will inevitably occur throughout a pregnancy. An app called Maven has begun to address this problem. Self-described as “the first digital clinic for women,” Maven virtually connects users through a video chat interface to doctors, nurse practitioners, specialists, and doulas in order to assist women in accessing affordable and personalized maternal health care. Users pay a predetermined fee per appointment and they can receive medical consultations and prescriptions, allowing for a streamlined digital reproductive health service.

The app allows women who may have full-time jobs, a disability that make travel difficult, or trouble affording the costs of in-person clinical care to speak with a medical professional about topics such as fertility, pregnancy, childcare, breastfeeding, and prenatal and postnatal care. Maven’s doulas provide “emotional and educational support for expecting mothers” and offer video conferencing with patients on subjects such as physical discomfort during pregnancy, lactation, birth planning, and childbirth education.

Other innovations, such as the FDA-approved Sense4Baby™ by Airstrip®, connect health care providers to pregnant women right in their own homes. The handheld monitoring device attaches to a woman’s body, observing both maternal and fetal vitals, the results of which are then wirelessly transmitted to her smartphone or tablet via the Airstrip® app and then to her doctor. Apple has even collaborated with Airstrip® to allow the Apple Watch to perform the same monitoring as the handheld device. Moreover, the watch can monitor the fetus while the woman is in labor, allowing the patient to “get up and move around without having to worry about being tethered to monitoring equipment.”

The Sense4Baby™ system also allows pregnant women to self-administer non-stress tests (NST), a common prenatal test used to monitor medical indicators like a fetal heartbeat or a woman’s

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lxxi Complaint, no. 60CV-14-618.
lxxiii ibid.
contractions if she is in her third trimester. The information gathered is then uploaded into a private, HIPAA-compliant cloud server where a doctor can monitor the results. Without the Sense4Baby™, the NST must be performed in person by a technician and takes 20-60 minutes. While the price of this product is prohibitive for many, those who can afford it are spared the need to take hours off work multiple times a week to travel to a provider. The technology also increases a provider’s capacity and flexibility, allowing them to see more patients than would otherwise be possible. Today, one in six babies born in the U.S. is monitored with AirStrip™ and the product has been used to monitor more than three-and-a-half million pregnant women.¹⁰⁸

**Sexual health**

The World Health Organization defines sexual health as “a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity.” ¹⁰⁹ Aside from the contraception, abortion, and prenatal care discussed above, sexual health care includes:

- Prevention and treatment of HIV, viral hepatitis, and other sexually transmitted infections (STIs);
- Screening and counseling for domestic and interpersonal violence; and
- Confidential and culturally competent services related to sex and sexuality that take into account factors such as race, ethnicity, gender, socioeconomic status, sexual orientation, gender identity, age, HIV/AIDS status, disability, and incarceration.¹¹⁰

Unfortunately, Americans face numerous barriers to sexual health care. These include stigma around sex, lack of sex education, a shortage of culturally competent care, high costs and lack of insurance coverage, and politically motivated governmental funding cuts to health clinics. The effects of a lack of access to sexual health care can be drastic and can include unintended pregnancy, unhealthy relationships, infertility, disease, or even death. To highlight, 19.7 million new STI cases are reported every year in the U.S.,¹¹¹ 41% of high school students reported not using a condom the last time they had sex,¹¹² and 13% of women and 6% of men have experienced sexual coercion at some time in their lives.¹¹³

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¹⁰⁸ Ibid.
¹¹⁴ Specifically, of the U.S. high school students surveyed in 2013, 34% had sexual intercourse during the previous three months, and, of these, 41% did not use a condom the last time they had sex. “Sexual Risk Behaviors: HIV, STD, & Teen Pregnancy Prevention,” U.S. Centers for Disease Control and Prevention, Division of Adolescent and School Health, last modified April 15, 2016, http://www.cdc.gov/healthyyouth/sexualbehaviors/.
There are countless ways that telemedicine can be used as an intervention in the realm of sexual health. For instance, telemedicine is helping prevent and detect cervical cancer through a procedure known as telecolposcopy. Since the invention of the Pap smear 40 years ago, cervical cancer rates have plummeted 70% nationwide. Yet while cervical cancer is one of the few cancers that are entirely preventable, it still plagues a significant number of women in the U.S. According to the U.S. Centers for Disease Control and Prevention (CDC), in 2012 (the most recent year for which data has been compiled), 12,042 women were diagnosed with cervical cancer and 4,074 women lost their lives to the disease.

Most cervical cancer is a result of exposure to certain strains of the Human Papillomavirus (HPV) in combination with a lack of access to appropriate screening and treatment. If abnormal cells in the cervix are identified early, especially before they become cancerous, most cervical cancers can be avoided. After an abnormal Pap (meaning a Pap smear that detects some unusual-looking cells), providers usually perform a colposcopy, which is an examination of the cervix and the tissue of the vagina and vulva using a microscope. The exam gives doctors a close-up view of the area in which the cells were detected. A biopsy is usually then performed to test the cells for cancer.

Rural and underserved communities often lack the medical experts needed to diagnose and treat cervical cancer, such as cytologists and histopathologists. To address this problem, providers have begun using teleconferencing and cloud-based systems to allow experts to view patient history and data; digital images from colposcopies; and cytology, laboratory, and pathology reports. In Arkansas, for example, there was only one provider group as of 2013 capable of conducting the follow-up procedures required after an abnormal Pap: the University of Arkansas for Medical Sciences. This provider shortage put the necessary follow-up care geographically out of reach for many of the state’s women. Accordingly, the U of A collaborated with the Center for Distance Health to develop a program in which patients who have had an abnormal Pap can receive follow-up care through telemedicine. Specifically, one of the hospital’s obstetrician-gynecologists performs a video call during which they supervise an advanced practice nurse or nurse practitioner who is performing a colposcopy followed by a biopsy, if needed.

This program has been a clear success in expanding access to colposcopy services. Researchers found that the colposcopies performed via telemedicine were just as effective at predicting cervical cancer as traditional colposcopies. Likewise, patients reported high levels of satisfaction with the telecolposcopy. Indeed, when the pilot’s patients were given the option of traveling to have the colposcopy performed at the university or having it done via telemedicine, almost all chose telemedicine. Not only is the innovation safe and effective, but cost saving as well. It is clear that without the program, thousands of cases of cancer could go undetected: 74% of the patients involved in

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loxix Hitt et al., “Telemedical Cervical Cancer Screening,” 404.
loxix Ibid., 406-07.
loxix Ibid., 407.
loxix Ibid.
the pilot program reported that without the U of A’s telecolposcopy program, they would have waited at least six months or not sought care at all; 61% said they would have waited at least twelve months or not sought care at all.\footnote{Ibid.}

Another area where telemedicine is useful is in STI prevention and treatment. STIs are widespread in the U.S. and providers across the country see telemedicine as a useful tool to prevent, screen for, and treat them. Like the “Planned Parenthood Care” app discussed earlier in the context of contraceptive services, the “Planned Parenthood Direct” app offers chlamydia and gonorrhea screening. Unlike the birth control app, however, Planned Parenthood Direct does not use video conferencing, making it an attractive option for individuals with privacy concerns. The app allows users to request an at-home STI testing kit that screens for chlamydia and gonorrhea. The kit, along with instructions for use, is mailed discreetly and directly to the user’s home where the patient takes a urine sample and mails it back to Planned Parenthood. After the clinic tests the specimen, results are sent back to the patient through the app. If the patient tests positive for an STI, a Planned Parenthood clinician will send an oral antibiotic prescription to the patient’s local pharmacy. In the case of gonorrhea, a patient will have to visit a local clinic to receive an antibiotic injection in addition to the oral antibiotic. The program is currently being piloted in California and will expand to other areas if successful.\footnote{Another area where telemedicine is useful is in STI prevention and treatment. STIs are widespread in the U.S. and providers across the country see telemedicine as a useful tool to prevent, screen for, and treat them. Like the “Planned Parenthood Care” app discussed earlier in the context of contraceptive services, the “Planned Parenthood Direct” app offers chlamydia and gonorrhea screening. Unlike the birth control app, however, Planned Parenthood Direct does not use video conferencing, making it an attractive option for individuals with privacy concerns. The app allows users to request an at-home STI testing kit that screens for chlamydia and gonorrhea. The kit, along with instructions for use, is mailed discreetly and directly to the user’s home where the patient takes a urine sample and mails it back to Planned Parenthood. After the clinic tests the specimen, results are sent back to the patient through the app. If the patient tests positive for an STI, a Planned Parenthood clinician will send an oral antibiotic prescription to the patient’s local pharmacy. In the case of gonorrhea, a patient will have to visit a local clinic to receive an antibiotic injection in addition to the oral antibiotic. The program is currently being piloted in California and will expand to other areas if successful.}

Barriers to HIV/AIDS care can be even more challenging. People living below the poverty line are more likely to live with HIV/AIDS\footnote{Barriers to HIV/AIDS care can be even more challenging. People living below the poverty line are more likely to live with HIV/AIDS and the monthly out-of-pocket costs of treatment can range from $2,000 to $5,000 per patient. Lack of transportation, unstable housing, stigma, discrimination, and privacy concerns further deter people from seeking the life-saving care they need. The combination of such factors can cause a person living with HIV to develop full-blown AIDS, a preventable development for those with the means to access care. In addition, barriers to care have a disproportionate impact on people of color: the HIV prevalence rate for blacks is more than eight times the rate of whites and the rate for Hispanics is three times the rate of whites. Compared to other racial groups, black people living with HIV in the U.S. are “the least likely to receive ongoing care and effective treatment.” The HIV/AIDS epidemic is even more devastating in the South, where proper care is harder to find and where stigma, homophobia, and discrimination against people living with HIV are especially high. While Southern states comprise about one-third of the overall U.S. population, the region accounts for an estimated 44% of all people living with an HIV diagnosis in the U.S.} and the monthly out-of-pocket costs of treatment can range from $2,000 to $5,000 per patient.\footnote{Ibid.} Lack of transportation, unstable housing, stigma, discrimination, and privacy concerns further deter people from seeking the life-saving care they need. The combination of such factors can cause a person living with HIV to develop full-blown AIDS, a preventable development for those with the means to access care. In addition, barriers to care have a disproportionate impact on people of color: the HIV prevalence rate for blacks is more than eight times the rate of whites and the rate for Hispanics is three times the rate of whites.\footnote{African American and hispanic/Latino women are more likely to live with HIV/AIDS than any other racial group. The African American population makes up about one-third of the overall U.S. population, yet accounts for an estimated 44% of all people living with an HIV diagnosis in the U.S.} Compared to other racial groups, black people living with HIV in the U.S. are “the least likely to receive ongoing care and effective treatment.”\footnote{https://www.americanprogress.org/issues/poverty/news/2010/07/21/8101/poverty-2015/06/16/std-test-app/#fphavTY2S8qg.} The HIV/AIDS epidemic is even more devastating in the South, where proper care is harder to find and where stigma, homophobia, and discrimination against people living with HIV are especially high.\footnote{https://www.americanprogress.org/issues/poverty/news/2010/07/21/8101/poverty-2015/06/16/std-test-app/#fphavTY2S8qg.} While Southern states comprise about one-third of the overall U.S. population, the region accounts for an estimated 44% of all people living with an HIV diagnosis in the U.S.\footnote{https://www.americanprogress.org/issues/poverty/news/2010/07/21/8101/poverty-2015/06/16/std-test-app/#fphavTY2S8qg.}
To help address the nation’s HIV/AIDS epidemic, providers have been using telemedicine to expand access to HIV care in both rural and urban settings. For instance, the Urban HIV Telemedicine Program at the University of California San Francisco (UCSF) allows UCSF HIV experts to connect with patients who have limited ability to meet in person. Established in 2010, the program is the first of its kind in the U.S. and serves four clinics in the San Francisco Bay area. At a clinic, patients interact with UCSF staff through a two-way videoconferencing system. The experts offer HIV primary care (which includes HIV testing, treatment, and Pre-Exposure Prophylaxis or PrEP), nutrition counseling, pharmacist services, and mental health services. 79% of the program’s patients participating in an evaluation stated that they would prefer a telemedicine appointment to an in-person visit for their next appointment.\textsuperscript{ciii}

Similar programs have been established in rural areas. For example, Medical AIDS Outreach in Montgomery, Alabama allows specialists based in the city to videoconference with patients at clinics in 47 Alabama counties and provides services similar to those at UCSF.\textsuperscript{cii} The program’s creator received the 2015 HIV Practice Award from the American Academy of HIV Medicine and the Institute for Technology in Health Care for his innovation.\textsuperscript{civ} Although it is not a silver bullet, telemedicine can help eliminate significant obstacles to HIV care by reducing the burden and cost of traveling to specialists, while also allowing specialists to treat more people than would normally be possible.

Conclusion

Reproductive health care is ripe for expansion and innovation by the telemedicine community, due in large part to existing barriers and shortages in care. Policymakers, medical practitioners, pharmacists, and health advocates should work to ensure that access to reproductive health services – including contraception, abortion, prenatal, and sexual health care – are as accessible as possible. Effective models already exist within the telemedicine community and could be replicated successfully in the field of reproductive health. Such replication could result in greater convenience and cost savings for patient and provider, the ability of providers to increase the number of patients they can treat, expanded patient access to specialists, and improved quality of care.

Unfortunately, many states have already passed laws banning telemedicine for medication abortion, despite a complete lack of evidence that such bans improve patient health. Not only does this further stigmatize abortion as “different” from the rest of health care, it puts critical care even more out of reach. Due to the forced shutdown of abortion clinics that has swept the nation, women are already struggling to find the care they need. Adding telemedicine bans to an already abysmal landscape cuts people off from both in-person and remote options.

Reproductive health care is an essential part of a person’s physical and mental well-being and restrictions on such care that are based not on evidence and best practices, but on ideology, are an attack on the medical community at large. When politicians substitute their medical judgment for that of trained medical professionals, they jeopardize patient health and undermine the doctor-patient

\textsuperscript{ciii} “Urban HIV Telemedicine Program,” University of California San Francisco, UCSF Wellness Center, accessed June 24, 2016, http://360.ucsf.edu/content/urban-hiv-telemedicine-program.
relationship. Such misguided attempts to curtail the practice of medicine are impractical and inappropriate and should be squarely rejected.

Telemedicine has already proven to be a huge success in the field of reproductive health care, creating platforms aimed at increasing screening for cervical cancer, reducing miscarriage rates, and preventing unintended pregnancies and STIs. As reproductive care is continually restricted at the federal, state, and local levels, it is crucial that the medical community continue to expand telemedicine in order to spur medical innovations and compensate for the damage done by political cuts to care. Every individual should have access to the safest, most effective, appropriate medical technologies available, including telemedicine. Only then can people truly have the tools and resources they need to prevent, plan, and end pregnancies as needed; to become pregnant and support healthy pregnancies when desired; and to maintain their health and well-being throughout their reproductive years.