### Overview/definition of topic

- In 1996 the Institute of Medicine (IOM) defined telemedicine as "the use of electronic information and communications technologies to provide and support health care when distance separates participants."\(^1\) While telemedicine and telehealth are often used interchangeably, telemedicine refers to the provision of direct clinical services, whereas telehealth refers more broadly to a range of health-related services encompassing education, public health, and health administration.\(^2,3\)

- Information can be delivered through telemedicine in two ways: 1) synchronous, in which care is provided virtually and in real-time from a remote location; or 2) asynchronous ("store-and-forward"), in which consultations, lab, and radiology results are provided or interpreted by experts offline.\(^4\)

- Technological advances and widespread use of the internet allow for the exchange of digital imagery or videos, teleconsultation, and even the remote control of procedure equipment to aid in the provision of care from remote locations.\(^5,6\)

- Telemedicine practices have been successfully used in various reproductive health settings, including for the provision of medical abortion,\(^7\) subspecialty care for management of HIV/AIDS,\(^4\) and obstetrics practice.\(^6,8–10\)

### Relevance to patient-centered outcomes

- Telemedicine increases access to health services, thereby decreasing the burden on providers of care and individuals seeking care. This can improve health outcomes, improve quality of care, enhance educational opportunities for providers, and provide socioeconomic benefits to patients, providers, and the health care system.\(^11\)

- Telemedicine for reproductive health services, particularly where providers or services may be limited, will provide men and women with access to needed services regardless of their location.

### Public Health Burden

**Recent prevalence in populations and subpopulations**

- According to a comprehensive survey of all states' Medicaid programs, 48 states and the District of Columbia (DC) have a definition in law, regulation, or their state’s Medicaid program for telehealth or telemedicine.\(^12\)
  - Live videoconferences are the most commonly covered service, with 46 states and DC’s Medicaid programs offering some type of reimbursement for these services.
  - Store-and-forward and remote monitoring telemedicine services are reimbursed by fewer states, with 9 and 14 state Medicaid programs offering some reimbursement for these services, respectively.
  - Only one state, Arizona, had explicit mention of obstetrics/gynecology as an eligible service area for reimbursement. However, Arizona explicitly forbids the use of telemedicine for abortion provision.\(^12\)

- Roughly 20% of the U.S. population has limited or no access to a primary care provider because of provider shortages in their communities.\(^13\)
to family planning services also remains a concern, particularly for individuals who are low-income and those living in medically underserved areas with limited access to primary care or other providers.  

### Effects on patients' quality of life, mortality, morbidity, use of health care services

- Poor access to reproductive health services, particularly in rural and other medically underserved areas, can have significant negative impacts on individuals’ quality of life. Limited access is associated with more unintended pregnancies, higher sexually transmitted infection (STI) and cervical cancer rates, and higher morbidity and mortality rates for mothers and infants.  

- In rural areas, patients and providers may both face excessive travel distances and times to health facilities. Prior to 2008, when the organization began providing telemedicine medical abortions, providers at Planned Parenthood of the Heartland in Iowa traveled up to 400 miles round-trip to provide abortion services at smaller clinic sites. Women could face similar travel distances to access services.

### Options for Addressing the Issue

#### Telemedicine for medical abortion

- Medical abortions provided through telemedicine have been found to be as safe and effective as those provided in-person.
  - Following implementation of telemedicine medical abortions at Planned Parenthood health centers in Iowa in 2008, clinic patients were more likely to access medical abortion services and abortion services before 13 weeks gestation. Though the overall abortion rate in Iowa decreased during the period, patients in more rural areas of the state were more likely to access abortion care, especially early medical abortions.

- In Vancouver, Canada, telemedicine medical abortions provided in a patient’s home via Skype were also found to be safe and effective.
  - Eight of the 11 women receiving medical abortions through this service between 2012 and 2013 had successful abortions without complications. One woman had a spontaneous abortion without medication, one woman was lost to follow-up, and one woman required surgical completion of the abortion.

- In countries where safe abortion services are not available, Women on Web (WoW) provides access to medical abortions through telemedicine that have been found to be safe and effective, even for late first trimester abortions, with outcomes comparable to those of medical abortions in outpatient settings.

#### Telemedicine in obstetrics

- The use of telemedicine is well documented in the field of obstetrics, and the scope of its use has been developing rapidly over the last several years. Telemedicine has been used to conduct ultrasounds in real-time, interpret tests and read ultrasounds, counsel patients, consult specialists, manage diabetes in pregnant women, and manage postpartum depression.

- Arkansas’ Antenatal and Neonatal Guidelines, Education, and Learning System (ANGELS), a partnership between the state Medicaid program and the University of Arkansas for Medical Sciences (UAMS), offers weekly real-
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<td>time telemedicine conferences between community physicians and specialists, real-time antepartum care, and real-time ultrasound exams, among other services.</td>
<td>Findings show a slight decrease in the number and percentage of high-risk pregnancies identified since ANGELS began, that identification of high-risk pregnancies is shifting from the second to the first trimester, and that access to prenatal care across the state has increased.</td>
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<td>A similar program in Tennessee, Solutions to Obstetrics in Rural Counties (STORC), has improved high-risk pregnancy outcomes. Only 2% of patients had to travel more than 50 miles to access care through STORC, which was translated into a savings of $29,148 by eliminating excessive travel time and mileage. Additional cost savings from reduced Neonatal Intensive Care Unit (NICU) stays also encouraged TennCare, Tennessee’s Medicaid program, to begin talks with STORC in 2011 for reimbursement.</td>
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<td>A fetal telecardiology program in the United Kingdom was also found to be highly acceptable to patients and to significantly decrease travel times and days taken off work.</td>
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<td>Telemedicine for management of sexually transmitted infections (STIs)</td>
<td>Telemedicine has been successfully used to manage care for people living with complex and chronic conditions, such as HIV/AIDS or hepatitis C, in settings with limited access to providers. Two evaluations of telemedicine programs targeting people living with HIV/AIDS seeking care at rural Veterans Affairs health centers showed telemedicine led to higher rates of clinic visit completion, increased screenings for associated common comorbidities, reduced travel time to seek specialty care, and high rates of patient satisfaction.</td>
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<td>Project ECHO (Extension for Community Health Outcomes) in the Pacific Northwest and New Mexico uses telemedicine to connect rural providers to specialists in chronic disease management. Project ECHO increases access to specialist care, increases rural providers’ job satisfaction, and decreases feelings of professional isolation.</td>
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<td>In Spain, a Virtual Hospital system to provide HIV-infected patients with virtual consultations, a telepharmacy, a virtual library, and virtual community of other patients has been found to be popular among patients, reduce consultation times, and reduce the number of hospital visits. Providers found that patients had similar changes in viral load, levels of compliance with treatment, and quality of life measures as those patients receiving standard care.</td>
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<td>Telemedicine is improving access to care for incarcerated individuals in the U.S. who have high rates of HIV/AIDS and hepatitis C infection, limited access to necessary providers, and face facility-specific issues around transporting incarcerated individuals to outside clinics.</td>
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<td>Cost effectiveness</td>
<td>The cost-effectiveness of telemedicine programs has been demonstrated in obstetric care programs and outside the scope of reproductive health</td>
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<td>• Cost savings may also be found through reduced numbers of patient visits to clinics, increased patient panels as clinics become more efficient, and decreased numbers of high-cost negative outcomes such as hospitalizations.²</td>
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What does the literature tell us about patient preferences?

**Telemedicine medical abortion**

• Telemedicine medical abortions were found to be highly acceptable to women, and women who received the telemedicine service were more likely than in-person visit patients to report they would recommend the service to a friend.⁷

• A qualitative analysis of telemedicine medical abortion patients from Planned Parenthood of the Heartland found that patients overwhelmingly chose their clinic and method of medical abortion (telemedicine or in-person) based on logistical concerns. Even if a patient would have preferred an in-person visit, other issues took precedent, such as closer proximity to the clinic, reducing time away from work or school, limiting costs associated with travel, and not having to explain the reason for traveling to a more distant location. Overall, patients were generally positive or indifferent about having their interaction with the physician via telemedicine rather than in-person.¹⁵

**Telemedicine for counseling**

• In a telehealth pilot study to engage and counsel HIV-positive African American youth via remote videoconferencing, participants reported liking telehealth, finding it convenient and efficient, and indicated that they would use it if offered in a clinic or research setting. Participants also described the video counseling as less intimidating than in-person visits.³²

• Telemedicine consultations in high-risk obstetric settings where fetal prognosis was poor were generally positively viewed by women. Respondents reported the decreased travel time and availability of family members or friends to accompany them to the consultation because of close proximity as positive aspects of the experience.³³

What does the literature tell us about provider preferences?

• Staff at Planned Parenthood of the Heartland saw introduction of telemedicine services as a welcome medical advancement, and reported that it brought benefits to their clinic (greater efficiency, fewer cancelled appointments) and to their patients (enhanced access, reduced travel).¹⁵

• Community providers in Tennessee were receptive to the telemedicine visits provided through STORC and appreciative of the supportive, consulting nature of the practice, which allows them to retain care for their patients.²²

What could new research contribute to achieving better patient-centered outcomes?

• Research comparing patient outcomes from care delivered via telemedicine versus standard of care for reproductive health services, particularly contraception provision and STI testing and management could provide strong evidence to support the expansion of telemedicine for reproductive health services beyond current practices. This research should include a focus on the comparative effectiveness of telemedicine reproductive health programs across various subpopulations (e.g., across ages, genders, races and ethnicities, etc.) and on reduced health disparities for populations with
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<td>improved access to reproductive health services following introduction of telemedicine programs.</td>
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<td>• Research on effective program structures, and reimbursement and funding models, could help provide a roadmap to other telemedicine programs in order to support the effective implementation and sustainable integration of telemedicine services into clinical reproductive health care. This should include research on the financial and non-financial outcomes of expanding reproductive health care through telemedicine, and the comparative effectiveness of education and provider training models needed to support the development a successful telemedicine program.</td>
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<td>• Research on whether telemedicine is an effective method of providing continuing medical education to providers in remote locations may help to expand quality care and training in reproductive health care even without provision of direct care through telemedicine.</td>
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<td>Have recent innovations made research on this topic especially compelling?</td>
<td>• Over the past decade, increased access to technology and proliferation of enhanced broadband connection networks have helped to enable the establishment of rapid video and audio connections. These ongoing advancements in technology, coupled with the focus on reducing costs while increasing quality and access in health care, makes research into effective expansions of telemedicine compelling, especially for the provision of reproductive health services.</td>
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<td>• HRSA projects a shortage of approximately 20,400 physicians by 2020, largely due to increased demand for services resulting from population growth and aging, and assuming full Medicaid expansion under the Affordable Care Act. Some studies predict much higher shortages by 2025. These projections do not account for the increasing supply of nurse practitioners (NPs) and physician assistants (PAs) who could mitigate projected shortages if effectively incorporated into delivery systems. With full deployment of available NPs and PAs, HRSA projects a shortage of 6,400 providers by 2020. These shortages will likely disproportionately impact medically underserved areas and populations, underscoring the need for innovative methods to expand access to care.</td>
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<td>How widely does care now vary?</td>
<td>• Telemedicine and telehealth services vary greatly by state, both in how they are defined and restricted in policies and regulations and how they are reimbursed. As shown above, care also varies widely based on types of services for which telemedicine is being used.</td>
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<td>Considerations for disparities</td>
<td>• According to data from 2013, sexually active women aged 15-44 years living in rural areas were less likely to receive reproductive health services than their urban counterparts in the previous year.</td>
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<td>• A Colorado survey from 2004 found women aged 18-44 years living in rural areas planned for contraceptive use less and were more likely to have an unintended pregnancy than women living in more urban areas.</td>
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<td>• In 2008, only 6.4% of obstetrician-gynecologists (OBGYN) practiced in rural settings, and by 2010, 49% of U.S. counties lacked an OBGYN.</td>
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|          | • In Colorado, where almost 75% of counties are considered rural, substantial numbers of women of reproductive-age live in counties where there is no
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|          | identified pharmacy or health clinic that prescribes or fills prescriptions for contraceptives.  
|          | • In 2011, 38% of women of reproductive age lived in the 89% of U.S. counties that had no abortion clinics.  
|          | • Telemedicine in traditionally underserved areas, such as rural areas or those that lack provider specialties, telemedicine can connect local providers to specialists, referral hospitals, and tertiary care centers.  
|          | • Telemedicine has been used in many medical fields to improve access to care for rural populations and could help address the significant access disparities for reproductive health services. |
| Is there any research underway (as indicated by ongoing trials)? | A search was conducted on Clinicaltrials.gov for (abortion AND (telemedicine or telehealth)) and ((sexually transmitted infection or sexually transmitted disease) AND (telemedicine or telehealth)). All four of the trials that were open, terminated, completed, or of unknown status were relevant. No trials were found from a search of ((telemedicine or telehealth) AND (contraception or contraceptive)) or ((reproductive health) AND (telemedicine or telehealth)).  
|          | o Feasibility of Medical Abortion by Direct-to-Consumer Telemedicine  
|          | o A Randomized Online Health Experiment for a Safer Youth Sexual Behaviour (Norway)  
|          | o A New Telemedicine Approach for Chronic HIV/AIDS Patient Home Care (Spain)  
|          | o Telesonography Adaptation and Use to Improve the Standard of Patient Care Within a Dominican Community (Dominican Republic, not limited to reproductive health issues)  
|          | A search using similar terms was run on the Agency for Health Research and Quality (AHRQ) Health Services Research Project database. Of the seven studies that were found, three were relevant.  
|          | o Computerized counseling to promote positive prevention and HIV health in Kenya  
|          | o Impact of an integrated internet-based testing program for HIV and sexually transmitted infections in British Columbia  
|          | o Computerized brief intervention (BI) for binge-drinking HIV at-risk and infected African American women  
|          | Ten projects resulted from a similar search on the National Institute of Health’s Project Reporter, but none were relevant.  
|          | No grants on the topic are currently being funded by PCORI.  
<p>| While research is ongoing on reproductive health care delivered through telemedicine, it largely focuses on the areas of obstetrics, HIV/AIDS management, and medical abortion. New research should extend beyond these areas to evaluate new telemedicine programs focused on all aspects of reproductive health. |
| Evidence of importance to various stakeholder groups | • The Affordable Care Act (ACA) contains several explicit references to expanding telemedicine through Medicare and Medicaid. The Health Resources and Services Administration (HRSA), which is primarily responsible for service provision and improved health care in rural areas of |</p>
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<td>the U.S., has several competitive grant programs to test and support the expansion of telemedicine.³</td>
<td>• The American Telemedicine Association (ATA) supports reimbursement and licensing policies to further expand provision of health care through telemedicine, stating that “[t]here is no basis to deny a telehealth provided claim for a service that is already covered when using a traditional delivery method.”⁴⁰</td>
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<td>• Since March 2009, the American College of Obstetricians and Gynecologists (ACOG) has been urging their member clinicians to collaborate with rural health agencies and advocate for telemedicine as a way to improve disparities in obstetric and gynecological care in rural settings.⁴¹</td>
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### How likely is it that a new CER on this topic would provide better information to guide clinical decision making?

- Information on the successes of telemedicine programs specific to reproductive health services is limited outside of the provision of medical abortions, management of certain STIs, and obstetrics care. More information, including CER on various telemedicine models targeting different aspects of reproductive health, would prove very beneficial in designing programs to expand quality reproductive health care to underserved populations.

### Potential for New Information to Improve Care and Patient-Centered Outcomes

#### What are the facilitators and barriers that would affect implementation?

**Facilitators**

- There is significant unmet need for reproductive health care in areas with limited access to providers, and particularly in rural areas. Telemedicine has been effectively used across various areas of medicine to expand access to care and with new innovative technologies, we have increasing ability to provide a variety of services through telemedicine.
- Patients and providers are supportive of telemedicine programs. Providers in resource-constrained areas may be open to the potential reproductive health care expansion and support provided through telemedicine.²²,²⁶,⁴² Patients report appreciating the added level of convenience of telemedicine programs that allow access to care in their communities.¹⁵,³³

**Barriers**

*Start-up costs, reimbursement, and infrastructure challenges*

- Some Medicaid programs have limitations on types of providers that can be reimbursed for telemedicine services, types of services for which reimbursement is available, or restrictions on where reimbursable services are provided (e.g., only those provided in rural or underserved areas).¹²
- While most Medicaid programs have reimbursement policies for some telemedicine services, only 24 states and DC have laws governing private payer telemedicine reimbursement policies, and not all of these policies mandate reimbursement.¹²
- Expanding telemedicine services into resource-constrained settings, such as rural health clinics, can pose challenges with limited funding for start-up costs and limited ability to effectively locate and maintain telemedicine technology in some clinics.²,²⁶
  - A March 2012 report from the Guttmacher Institute on readiness for implementation of Health Information Technology (HIT) found that 73%
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<td>of family planning agencies have the appropriate internet connectivity and 57-59% have the necessary IT infrastructure and support to implement only basic HIT technologies such as third-party billing or electronic health records. This highlights an area of need before telemedicine can be effectively implemented.</td>
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<td>Individuals with expertise in creating telemedicine programs and providing care through telemedicine are needed to ensure the success of programs. Provider training and education may be needed, and clear guidelines on the role of providers at each end of the telemedicine visit, as well as patients, will be necessary.</td>
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<td>Care restrictions</td>
<td>Restrictions on how certain services are provided, such as requiring an initial visit in a medical abortion and only allowing mifepristone to be dispensed in clinics, medical offices, and hospitals by certified health care providers, limit the potential spread of telemedicine reproductive health services.</td>
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<td>Because of increased security and privacy concerns associated with telemedicine services, some states have telehealth-specific informed consent rules that may include additional disclosures that must be made to patients, and verbal or written consent that must be attained.</td>
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<td>Some states may impose additional licensure restrictions that could either facilitate or impede the provision of telehealth services across state lines.</td>
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<td>How likely is it that the results of new research would be quickly implemented into practice?</td>
<td>Unclear. The pace of implementation will depend on the specific area of care, the policies already in place governing provision of care, and the existing infrastructure and funding of involved organizations.</td>
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<td>Research showing the effectiveness and positive financial impact of telemedicine will support quick integration of telemedicine services into practice, particularly as health systems look for methods of cost savings and ways to expand their scopes of care.</td>
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<td>Programs that conflict with existing regulations or reimbursement policies will take longer to implement, as legislative or regulatory changes may be required.</td>
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<td>Would new information from patient-centered CER on this topic remain current for several years?</td>
<td>While the specific technology used in telemedicine will likely change in future, research on the delivery of care through telemedicine and the potential to expand care into underserved areas and specialties will continue to be relevant. Researchers should take into account the rapidly changing landscape of technology and develop research on the provision of services through telemedicine with this assumption in mind.</td>
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