

antihypertensives at study entry (292 [97%] in the Foley catheter group vs 289 [96%] in the misoprostol group), the median gestation in both groups was 39 weeks, most did not have proteinuria (156 [52%] vs 162 [54%]), and few had received magnesium sulphate in the previous 12 h (45 [15%] vs 42 [14%]). However, many pregnant women with hypertension have more severe disease. Pre-eclampsia is not just hypertension. It is a syndrome that can affect many organs of the body. Women with eclampsia, renal dysfunction, HELLP syndrome (haemolysis, elevated liver enzymes, and low platelet count), pulmonary oedema, and cardiac dysfunction need even more rapid delivery.¹² Although the INFORM study did not show any differences in rates of uterine hyperstimulation and neonatal outcomes, the percentage of caesarean sections done for meconium-stained liquor was doubled in the misoprostol group (30.6% vs 14.6%; absolute risk difference 16.1%, 95% CI 6.2–26.0). Women with hypertension, especially those with severe disease, often carry growth-restricted babies. Whether misoprostol increases the incidence of meconium-stained liquor by fetal gut stimulation or by fetal distress, the caesarean section rate is increased in settings where intrapartum fetal monitoring tests, like cardiotocography and fetal scalp pH, are not available. Further reductions in caesarean section rate could therefore be achieved by introducing fetal monitoring for those women receiving misoprostol.

The results of the INFORM study are encouraging for the use of low-dose misoprostol (25 µg) for induction of labour in patients with mild hypertensive disease in low-resource settings. However, further studies are

needed in women with severe, early-onset hypertensive disease and intrauterine growth restriction.

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Building virtual communities of practice for health

Advances in medical research and innovation mean little if they do not reach the patients who need them. Too often, specialised medical knowledge remains within the walls of academic and tertiary care centres in capitals and major cities, inaccessible to much of the world's population due to geographical distance and economic disparity. To “ensure healthy lives and promote well-being for all at all ages”, UN Sustainable Development Goal 3, a more efficient and equitable way to disseminate new scientific knowledge and evidence-based expertise is needed.

During the past two decades, technology-enhanced communication and collaborative learning initiatives have converged to produce innovative and powerful learning platforms. The rise of Internet-based communication has spurred a revolution in online education and knowledge sharing, from massive open online courses (MOOCs), such as Coursera, to online learning platforms (eg, Khan Academy) and continuing education resources (eg, the University of Washington's HIV Web Study). Collaborative learning in health care has evolved rapidly; the Institute for

For UN Sustainable Development Goal 3 see <https://sustainabledevelopment.un.org/sdg3>
For Coursera see <https://www.coursera.org/>
For the Khan Academy see <https://www.khanacademy.org/>
For the HIV Web Study see <https://www.hivwebstudy.org/>
For Project ECHO see <http://echo.unm.edu/>

Healthcare Improvement's collaborative learning model offers one leading example.¹ Telemedicine also allows long-distance training for health-care professionals,² an effective method to deliver patient-centred, contextual medical curricula,³ and supportive supervision. Additionally, online social networking enables communities of practice⁴ that "offer the potential to bring together temporally and geographically dispersed actors to work towards a common purpose".⁵ Through technology, communities of practice are being implemented across health-care areas, such as integrated care,⁶ pain management,⁷ health visiting services,⁸ and nurse education.⁹ These virtual communities enable collaborative learning that transcends geography.¹⁰

What if virtual communities of practice were built intentionally to disseminate expert medical and public health knowledge and experience to help extend quality care? What if they connected front-line health-care workers in the primary care setting with teams of local and international specialists, who mentored and coached them in managing patients? What if communities of practice transformed core public health functions, such as disease surveillance and public health emergency response, by creating and supporting interactive networks of communication, coordination, and collaboration that connect districts to regional, national, and super-national levels of the health system?

The non-profit Project ECHO (Extension for Community Healthcare Outcomes) is an example of an initiative that is building such communities of practice in more than 23 countries on six continents. ECHO's collaborative model of medical education and care management uses multipoint video conferencing to enable virtual case-based communities of practice and learning that connect specialist teams at local, regional, and international academic medical centres and centres of excellence with primary care teams of doctors, nurses, pharmacists, behavioural health specialists, and community health workers in rural and underserved locales. Primary care teams and specialists hold weekly virtual teleECHO sessions focused on complex, chronic conditions, such as HIV, tuberculosis, hepatitis C, cancer, and women's reproductive health, or on core public health functions or emerging health systems challenges. Front-line clinical and public health



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practitioners present de-identified patient, population health, and health systems quality improvement cases to the interprofessional specialist team for discussion and recommendations for patient or population health management. Through routine engagement that involves coaching and mentoring in teleECHO clinics, providers and public health specialists become experts and over time acquire the knowledge and skills to treat patients with complex conditions and manage critical public health programmes within their communities.^{11,12}

Virtual communities of practice such as those that use the Project ECHO model go beyond MOOC-style virtual classrooms by developing knowledge networks that promote real-time multidirectional learning and teaching, with a strong emphasis on peer-to-peer sharing and learning. Knowledge delivery and mentoring are combined with opportunities for live discussion and problem solving in situations where meeting in person is impractical and cost-prohibitive.

The success of virtual communities of practice is dependent on basic infrastructure such as electricity and internet bandwidth. However, cloud-based video-conferencing platforms are now accessible to nearly anyone with a webcam-enabled computer, tablet, or smartphone, and the growth of cellular availability in sub-Saharan Africa and low-income countries has enabled many new applications of technology in health.^{13,14} Additional challenges to the implementation of virtual communities of practice include the need for clinical and public health experts and participants

to have protected time to participate, and adapting a model of learning that is non-hierarchical, participatory, and dynamic in contexts where such an approach might be unfamiliar. Despite these challenges, ECHO programmes are being implemented in Argentina, Australia, Brazil, Canada, Côte d'Ivoire, Ecuador, Egypt, Georgia, India, Kazakhstan, Kenya, Mexico, Namibia, Tanzania, Uganda, the UK, Uruguay, and Vietnam.

Namibia's Ministry of Health and Social Services has a weekly HIV teleECHO programme to support physicians, nurses, and pharmacists who care for more than 80 000 patients with HIV in more than 15 regional and district hospitals and health centres.¹⁵ In India, the Government's National Institute for Tuberculosis and Respiratory Diseases has established a tuberculosis teleECHO programme that supports 25 district tuberculosis office teams across Delhi who care for nearly 60 000 patients annually with active tuberculosis; the focus of this programme is to strengthen care for the more than 3000 patients with drug-resistant tuberculosis who receive care each year. In Uruguay, the Universidad de la República collaborates with the MD Anderson Cancer Center in the USA to run a multinational cervical cancer teleECHO programme that trains providers throughout Latin America. In the UK, Northern Ireland Hospice has implemented a teleECHO programme for palliative care, and the Health and Social Care Board of Northern Ireland has expanded the initiative to offer teleECHO programmes for 24 different conditions, including chronic obstructive pulmonary disease, dementia, and diabetes. Globally, Project ECHO is increasingly being adapted to support community-health-worker initiatives; maternal and child health services; public health programme management; quality improvement; and essential public health systems, such as laboratories, field epidemiology, and surveillance initiatives, and other areas of relevance for global health security.

Virtual communities of practice like Project ECHO facilitate use of scarce health-care resources to promote continual learning and collaboration, breaking the distance barrier that blocks timely access to medical and public health knowledge and expertise in many parts of the world. As characterised within the Sustainable Development Goals, the magnitude and complexity of efforts to reduce preventable morbidity and mortality

require continued focus on adapting innovative strategies for learning collaboration and telementoring to new settings and new challenges. To achieve healthy lives and wellbeing for all, the right knowledge must get to the right place at the right time for those who need it most.

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