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VIEWPOINT

Taking Paediatrics Abroad: Working with low- and middle-income countries in a global pandemic

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Children and young people around the world face challenges to their health and wellbeing. In particular, in low- and middle-income countries they experience a higher burden of disease, exacerbated by global inequity limiting access to quality health care. According to the inverse care law, the availability of quality health care varies inversely to the need of the population, and hardworking health-care professionals in under-resourced countries may face impediments to continued education or subspecialty training. In line with the Sustainable Development Goals, collaborations have been developed between high-income and low- and-middle-income countries to address global disparities in health. These collaborations face challenges of high financial costs, difficulties creating long-term sustainable change, and with the emergence of the COVID-19 pandemic, border closures preventing fly-in volunteers. In this paper, we describe the development of an innovative, paediatric-specific model of care for training and support between high- and low-income countries – Taking Paediatrics Abroad Ltd. Taking Paediatrics Abroad supports the development of mutually beneficial relationships between Australian paediatric health-care professionals and paediatric health-care professionals in developing countries and remote, underserved Australian Aboriginal communities. Since May 2020, there have been over 100 sessions covering a vast array of paediatric specialties. This article explores Taking Paediatrics Abroad's model of care, its implementation and challenges, and opportunities for the future.

Background

All children have the right to survive and thrive, but children and adolescents around the world face challenges to their health and wellbeing. In 2019, 6.2 million children world-wide died under the age of 15, including 5.2 million children younger than 5.[1] Deficits in health care disproportionately affect low- and middle-income countries (LMICs), where this burden of disease is highest.[2,3] In order to have a truly equitable response to improve the health of the world's children so that they both survive and thrive in line with the WHO-UNICEF-Lancet Commission and the Sustainable Development Goals,[4,5] it is vital to continuously improve efforts to deliver appropriate and necessary health care around the world. However, hardworking health-care professionals in under-resourced LMICs face barriers to their opportunities for continued professional education or subspecialty training.[6]

To address this global inequity, there is a long history of collaboration between high-income countries (HICs) and LMICs. From Australia and New Zealand, some of the earliest efforts to improve paediatric health internationally were from the Royal Australasian College of Surgeons, providing surgical aid, training, and support.[7] These programmes were very effective as they adapted to local circumstances and worked closely with local specialists. Similarly, Radiology Across Borders has been offering radiology teaching face-to-face and online.[8] Although medical aid has been historically less involved in supporting clinical care in the Asia-Pacific region, there are emerging medical organisations that offer practical support. For example, oncology collaborations between Australia and New Zealand and LMICs provide training, observerships and twinning partnerships, although there is still room for improvement and formalisation of training opportunities.[9] Paediatric-specific medical organisations are even more scarce, although links do exist between some Australian children's hospitals and overseas paediatric hospitals, including the University of Melbourne's Centre for International Child Health.[10]

Many of the existing models of collaboration involve Australian and New Zealand volunteers flying in and providing support or education in country. However, there are ongoing challenges with this fly-in-fly-out model of care. Firstly, it often comes at a high financial cost. The global cost of short-term medical missions was estimated to exceed US$3.7 billion in 2016.[11] In addition, the carbon footprint of even short flights is significant. Each passenger on a return flight from London to Rome generates 234 kg of carbon; this is higher than the yearly emissions produced by the average person in 17 countries.[12] To avoid contributing to global health inequity, charitable medical organisations need to create effective, affordable and sustainable strategies that aim to improve health care in LMICs by sharing

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expert support and education with paediatric health-care teams in those countries, with a focus on local health-care providers delivering the care.[6]

The biggest immediate and short-term barrier to the traditional model of charitable aid work is the emergence of the COVID-19 pandemic travel restrictions and border closures. As a result, the fly-in-fly-out aid model has been challenged to shift towards new, innovative methods of volunteering, including the integration of telehealth. Telehealth has been defined as medical information that is exchanged from one site to another *via* electronic communication to improve a patient's health.[13] The use of telehealth has increased within many HICs to address access barriers; in Australia, the Medicare Benefits Schedule was adapted in 2020 to introduce new funding for the provision of telehealth to support the mental health and wellbeing of those adversely affected by bushfires.[14] There are also instances of telehealth being used to provide support to LMICs; for example, Médecins Sans Frontières has used a telehealth service since 2010 to provide direct specialist expertise to field physicians.[15] Telehealth has provided medical aid models with a method of connecting medical teams across oceans and borders in place of, and in potentially future to complement, face-to-face visits.

In this paper, we describe an innovative, paediatric-specific model of care for training and support between high- and low-income countries – Taking Paediatrics Abroad (TPA) – that has used telehealth to address the global inverse care law. We will describe the development of TPA, its implementation and challenges, and opportunities for the future.

Taking Paediatrics Abroad

Taking Paediatrics Abroad Ltd. (TPA) is a charitable organisation established in 2019 that aims to support the development of mutually beneficial relationships between Australian paediatric health-care professionals and paediatric health-care professionals in developing countries and remote, underserved Australian Aboriginal communities in New South Wales.[16] TPA currently connects Australian paediatric health-care professionals with teams in the Solomon Islands, Vanuatu, Cambodia, Bangladesh and (newly in 2021) Tonga (Fig. 1).

TPA encourages effective reciprocal relationships and sustainable models of learning. Initially, the TPA model was planned to involve Australian paediatric specialists flying to associated LMICs and working alongside in-country paediatric teams to provide guidance and support patient management. Due to the COVID-19 border closures, the planned second phase of the TPA model, which involved the integration of telehealth into its existing systems, was rapidly accelerated. Paediatric teams in LMIC were requesting volunteer aid, and TPA was adjusted to utilise telehealth to meet this need, with paediatric subspecialists from HICs meeting paediatric teams from LMICs via video conference for the first time.

TPA sessions are generally case discussions blended with webinar-style teaching. Usually, paediatric colleagues in LMICs open the meeting by presenting a current or recent case, and expert discussion and education follows. This allows the sessions to target areas of need and answer specific clinical questions. Rapport is rapidly developed and often questions are

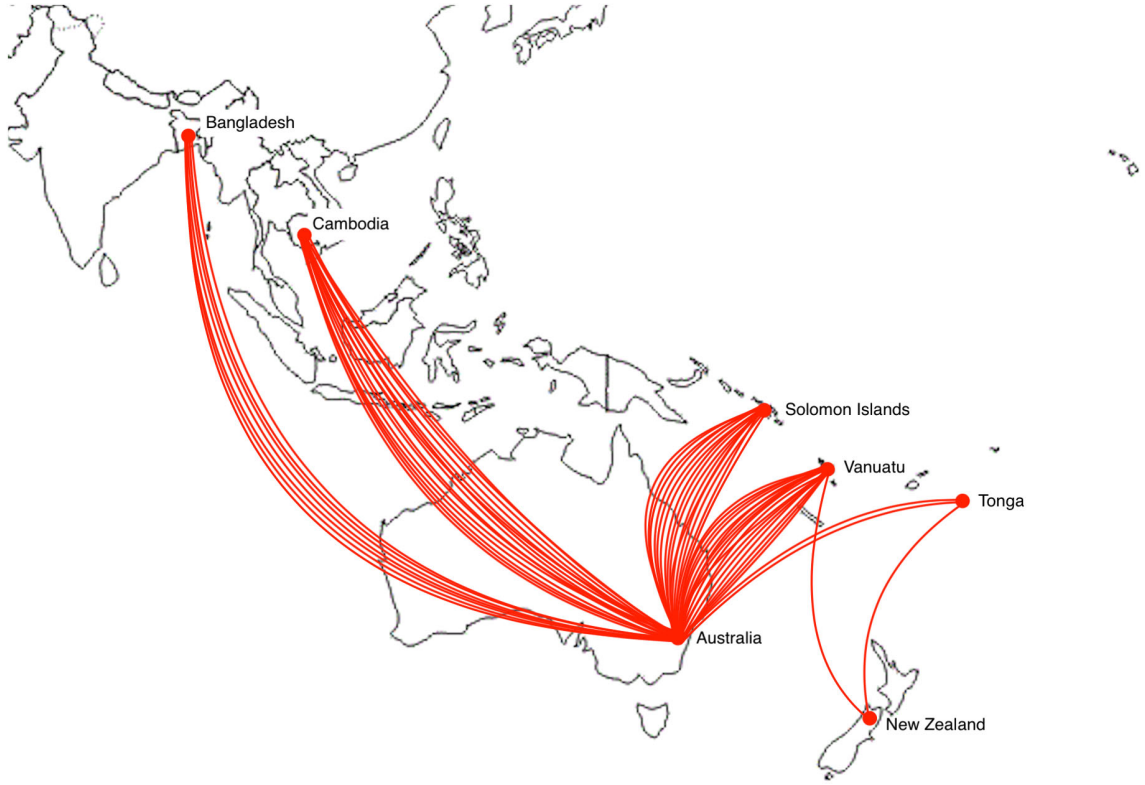

Fig. 1 Taking Paediatrics Abroad's current international network.

Box 1 Paediatric specialties involved with Taking Paediatrics Abroad thus far

- Cardiology
- Child development
- Child protection
- Clinical genetics
- Community paediatrics
- Dermatology
- Dietetics
- Emergency medicine
- Endocrinology
- Gastroenterology
- General paediatrics
- General surgery
- Immunology
- Infectious diseases
- Neonatology
- Nephrology
- Neurology
- Oncology
- Palliative care
- Psychiatry
- Respiratory medicine

invited by email beyond the scope of the actual session. Other sessions are run as interactive educational tutorials, often on topics requested by partner site paediatric colleagues. Diagnostic tests may also be facilitated through sending samples to Australia or arranging tests through TPA connections. Since May 2020, there have been more than 125 sessions, addressing a wide variety of areas including paediatric palliative care, emergency medicine, gastroenterology, cardiology, endocrinology and psychiatry (Box 1).

The Model of Care

TPA was established following detailed consultations with colleagues in each country, TPA's current model of care involves building enduring clinician-to-clinician relationships. Regular video link sessions between paediatric specialists in Australia and paediatric health-care professionals in LMICs are established using TPA's network of contacts. A TPA representative schedules, organises and moderates every meeting and arranges any follow-up. The meetings with LMICs are generally scheduled weekly to fortnightly depending on availability and need; paediatric teams in country are able to request additional sessions if necessary. There is a large network of paediatric specialists, so many specialists participate infrequently, but the same specialists will often arrange for follow-up meetings, particularly in the context of a complicated case. For Australian Aboriginal communities, paediatricians have been introduced to Aboriginal Controlled Community Health services and provide telemedicine-based patient consultations.

Notably, patients are not present during the meetings, so the paediatric health-care professionals in country remain the case managers, conducting regular patient examinations and ultimately determining treatment. This empowers paediatric teams to refine new management knowledge, skills and techniques *via* TPA, while also utilising their expert knowledge of culture and management skills in country. Respect for autonomy of in-country health practitioners is a central tenet of TPA's model.

A key strength of TPA's telehealth model is that it is a voluntary organisation with minimal costs compared to the expense of face-to-face engagement. In addition, the TPA model allows paediatric teams to request education and support on a needs-based system, meaning that the sessions are highly likely to improve expertise in relevant priority areas. The benefit of mutually beneficial relationships cannot be overstated; eliminating the volunteers' assumptions of 'priority' allows more accurate addressing of critical concerns and promotes a focus on the needs of colleagues in country.

TPA's model allows discussions of cases involving patients who are acutely or chronically unwell, improving the in-country care of these current patients by providing expert support and guidance as well as follow-up email or online discussions if necessary. Although online resources such as Up-to-date have become internationally available in recent years, the cost of such a resource and its generalisability to LMIC countries can limit its usefulness. Thus, the ability to consult a subspecialist on their area of expertise is a valuable resource for paediatric teams. Perhaps more importantly, however, is the enduring change that this management creates: assisting paediatric teams with developing the tools to handle complex medical cases improves confidence and skills for future situations.

There are limitations to TPA's model of care. For example, Australia and New Zealand paediatricians may find there is a learning curve about local constraints, including limited resources and the lack of possibility of retrieval. Similarly, there may be a knowledge gap related to cultural practices. Furthermore, Australia and New Zealand paediatricians may have a lack of local knowledge of diseases; however, one of the benefits of TPA is that it provides the opportunity for volunteering paediatricians to be exposed to new and different circumstances.

Benefits for health-care professionals from under-resourced areas

One of the key aspects of TPA is that of a mutually beneficial and supportive relationship. Anecdotally, feedback from recipient countries has been overwhelmingly positive, and participants have been enthusiastic about continuing the programme. Although there are major differences in clinical practice between the Solomon Islands, Cambodia, Bangladesh, Vanuatu and Tonga, paediatricians in these settings are true generalists, required to deal with a broad variety of complex patients. By connecting these paediatricians with highly subspecialised paediatricians in Australia and New Zealand, TPA is able to facilitate the ability to consult regarding complex patients. The subspeciality areas of discussion are driven by TPA's partners in the Indo-Pacific so that they address key gaps. Many of TPA's Australian contributors have worked extensively and for long periods of time in the Asia-Pacific and therefore have some knowledge of the local health systems.

TPA's sessions empower health-care professionals to manage diagnostic challenges and difficult cases through the support of

sub-specialist consultation and guidance. In addition, this support and guidance provides long-term benefit to the in-country treating team by increasing confidence and experience in managing complex cases, a benefit that extends to other children and young people. A useful example can be seen in Box 2.

Some sessions have been on topics that may be currently developing as a focus in recipient countries. For example, paediatric palliative care is emerging as an area of clinical specialty around the world; one 2011 study found no paediatric palliative care services in 65.5% of countries.[17,18] The paediatric palliative care sessions arranged by TPA have had positive feedback. Similarly, sessions on behavioural problems and developmental paediatrics have also provided beneficial education and guidance.

Through TPA, specialist advice has been provided to manage patients while awaiting retrieval surgery for repair of congenital heart conditions in the Solomon Islands. Similarly, in Vanuatu, echocardiography training was provided through TPA for a new echocardiography machine. By working closely with participants and responding to feedback and requests, TPA has been able to address hidden areas of need in countries with a variety of access to resources and funding.

Furthermore, the reflective aspect of TPA's sessions has been described by participants as being beneficial. As teams generally write up a case to present, reflection on management and communication is encouraged. In addition, debriefing after a challenging experience has been described by participants as being very helpful.

Benefits for volunteering Australian paediatric specialists

Contributing Australian health professionals involved have anecdotally described the benefits of altruism and improved teamwork skills, including broadening their cultural awareness. In addition, the challenges experienced by managing diagnostic dilemmas with limited resources enhances beneficial fundamental diagnostic skills and refines diagnostic techniques; a helpful example can be found in Box 3. Many cases presented in the TPA sessions are rare in Australia, and this allows specialists to expand their range of experience. Participating specialists regularly consult colleagues for advice on challenging situations, highlighting the complexity of cases regularly seen in LMICs.

Additionally, the experience of volunteering in the area of global health is likely to reinvigorate individuals, providing a fresh outlook on health care and society.[19]

Box 2 Case study

One paediatric team from a developing country contacted Taking Paediatrics Abroad (TPA) regarding a newborn with ambiguous genitalia. The Australian paediatric endocrinologist who was subsequently connected with the team by TPA was able to suggest a diagnosis of congenital adrenal hypoplasia, and to develop a structured plan for the team to follow if the baby deteriorated. The plan was followed successfully, and the team was extremely grateful for the expert advice, which they felt had helped to save the baby's life. The child is alive and well today.

Box 3 Case study

This case study involved refining management of type 1 diabetes, which had presented in an adolescent in a LMIC as diabetic ketoacidosis (DKA). The Australian paediatric endocrinologist recognised that the team had done well to make the initial diagnosis and start an insulin regime, as DKA is a rare presentation in that country.

The finessing of day-to-day management was challenging, involving balancing energy intake and expenditure, ideal HbA1C levels, and managing weight gain and growth, and the in-country team were grateful for the specialist's expertise. Notably, many patients in LMICs have to pay for insulin and glucometer strips out of pocket, adding to the complexity of management. The specialist appreciated the added complexity of patient management in this case.

Ethical benefits for participating services

Inequities have a significant impact on the health and development of children globally.[20] Spencer *et al*. argue that avoidable health inequalities are unjust, and that we have a moral duty to address them. This is supported by the United Nations (UN) Convention on the Rights of the Child, which advocates for child health equity and justice, meaning that every child has the right to good quality health care. The UN asserts that wealthier countries should help poorer countries achieve this.[21] Similarly, Denburg has argued that the discussion around global child health inequity and implementing the United Nations Convention on the Rights of the Child must shift towards that of individual moral duty rather than simply the 'impersonal ought' of theoretical ethics.[22] TPA's sharing of knowledge and expertise between HICs and LMICs not only improves inequity of access to specialist paediatric health care but is also developing a global community of practice and the collaboration of shared knowledge. This community model promotes the shift towards the perception of personal moral responsibility, and ultimately aids in the addressing of global health disparities.

Challenges

Challenges persist with the implementation of telehealth between participating countries in TPA. These include the well described issues of support, training, usability, and quality.[23] However, as a result of the COVID-19 pandemic, telehealth programmes are becoming increasingly more widespread and normalised. In addition, coordinating multiple groups of people to access a video link at the same time from multiple locations, as well as preparing cases for discussion beforehand, is sometimes challenging given the time demands on busy clinicians. However, session organisation has become more streamlined as appreciation of regular connection to paediatric sub-specialty expertise through TPA gains momentum.

Conclusion and Future Directions

The COVID-19 pandemic presented a significant challenge to the existing global effort to improve paediatric health and wellbeing.

The success of Taking Paediatrics Abroad's telehealth programme demonstrates that the pandemic does not need to prevent clinicians across HICs and LMICs from collaborating with the shared common goal of improving child health and strengthening the global health system.

When borders begin to reopen, telehealth will continue, and the aim is to expand to cover more countries, as well as clinical subspecialties for management of complex problems; furthermore, as technology develops, there will be more sophisticated sharing of imaging. In addition, TPA's telehealth sessions will be complemented with face-to-face training sessions in country in key areas, especially for hands-on and practical aspects of training. Informal feedback from participating countries is collected regularly; however, in future, TPA aims to perform a mixed-methods evaluation of the impact of the programme, providing a greater insight into lessons learned and benefits to participants. This will allow for targeted improvements and enable the beneficial aspects of the model to be shared with other aid programmes.

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