

## VIEWPOINT

# Broadening the Frontiers of Adolescent Health Through Telemedicine and Online Networks



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## INTRODUCTION AND HISTORIC BACKGROUND

Adolescent health and medicine has been considered a specialized area within Pediatrics for the past 60 years, since Dr. Roswell Gallagher established the first program in Boston and Dr Gómez Ferrarotti independently established a program in Buenos Aires.<sup>1,2</sup> Similar centers were founded soon after in Santiago de Chile; Mexico; and São Paulo and Rio de Janeiro, Brazil.<sup>3,4</sup> The University of the State of Rio de Janeiro has been one of these pioneer centers for training medical students and professional staff with a multidisciplinary team of workers since 1972. The Adolescent Clinical Unit where medical assistance and special care for hospitalized adolescents began kept increasing its services and evolved first into an out-patient department and then to several outreach and community extension programs. This was due mainly to the huge demand of health problems of teenagers between 10 and 18 years of age. Today, Núcleo de Estudos da Saúde do Adolescente (NESA) is part of the University Hospital Pedro Ernesto (HUPE), which has free access for any teenager regardless of their medical problem or socioeconomic background. Health rights, health promotion, health assistance, and free and public medical care for adolescents and young people have always been a priority and a professional commitment of NESA. In addition, NESA maintains a focus on training and capacity building, not only for Brazilians but also for many other health professionals from Latin America.<sup>5</sup>

By the turn of the century, advances in information and communication technologies (ICTs) created numerous opportunities to build a more equitable world. The Internet reinforces several networking bridges by improving education and broadening the

possibilities for dialogue among professionals of different areas as well as the ability to share medical information and consultancy through telemedicine and telehealth.

## THE TELEMEDICINE NETWORK

The Telemedicine University Network (RUTE) was launched in 2006, and by July 2017, its network covered 126 telemedicine units in medical schools and teaching hospitals spread across all Brazilian states. Its network is composed of 50 special-interest groups (dedicated to specific health areas) that hold 2 to 3 scientific videoconference sessions per day on average, engaging 380 different health institutions. Once certified, participating institutions are free to propose, create, and coordinate special interest groups (SIGs) covering medical topics, all operating under RUTE's infrastructure.<sup>6,7</sup>

The SIG Children and Adolescent Health and Medicine started its videoconferences in 2008 with a partnership network between the Medical Schools of the University of the State of Rio de Janeiro and Federal University of Bahia. The main objectives are to promote scientific activities through web and videoconferences; to develop medical training on child and adolescent health and medicine for medical students, interns, and residents, as well as for multidisciplinary and allied health teams; to promote research activities and debates; and to inform professionals on medical topics related to child and adolescent target groups. Ministry of Health representatives and Brazilian Pediatric Society specialty members are also welcomed, and so far, 28 university hospitals and centers have joined the network and participated in monthly videoconferences.

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The themes of the monthly sessions are diverse and selected by any hospital partner, ranging from health rights and ethics to early diagnosis of autism disorders, violence, accidents, sexual abuse, sexually transmitted diseases/HIV, drugs and alcohol, nutritional eating disorders and obesity, zika and chikungunya epidemics, and many others. The session is 1 hour long with questions and answers and interactive debate. All videoconferences are saved on a public digital video library and databank and are freely available for consultation thereafter. On September 21, 2017, we (professional members of the SIG, Special Interest Group of the Brazilian Telemedicine Network, RUTE, a total of more than 50 health professionals and pediatric staff around the country) celebrated our 100th session, with an important presentation on Safe and Healthy Internet for Children and Adolescents.

During the past 10 years, discussion of complex medical cases and consultation to obtain second opinions were completed through international videoconferences, which had a positive impact. A few of our (SIG-RUTE) collaborators are from Children's Hospital in Boston, MA; Children's Hospital in Patterson, NJ; and Medical Missions for Children, Johns Hopkins Hospital and Medical Institutions in Baltimore, MD; Georgetown University Hospital in Washington, DC; and Children's Hospital in Sydney, Australia. Videoconferences also have been held with Pan American Health Organization in Washington, DC, and with the World Health Organization in Geneva. Some public health education campaigns were launched, such as the Shaken Baby Syndrome, whose video was saved at a YouTube platform and has had more than 68,000 views.<sup>8</sup> An educational video on violence and abuse prevention and intervention also was produced with support from the International Society for Prevention of Child Abuse and Neglect (ISPCAN) and was part of an online course through the TeleHealth Service. For the past 5 years, more than 6000 health professionals completed the 10-modules web conferences classes with evaluation of field cases presented by the participants after completion of the 10-hour online course.<sup>9</sup>

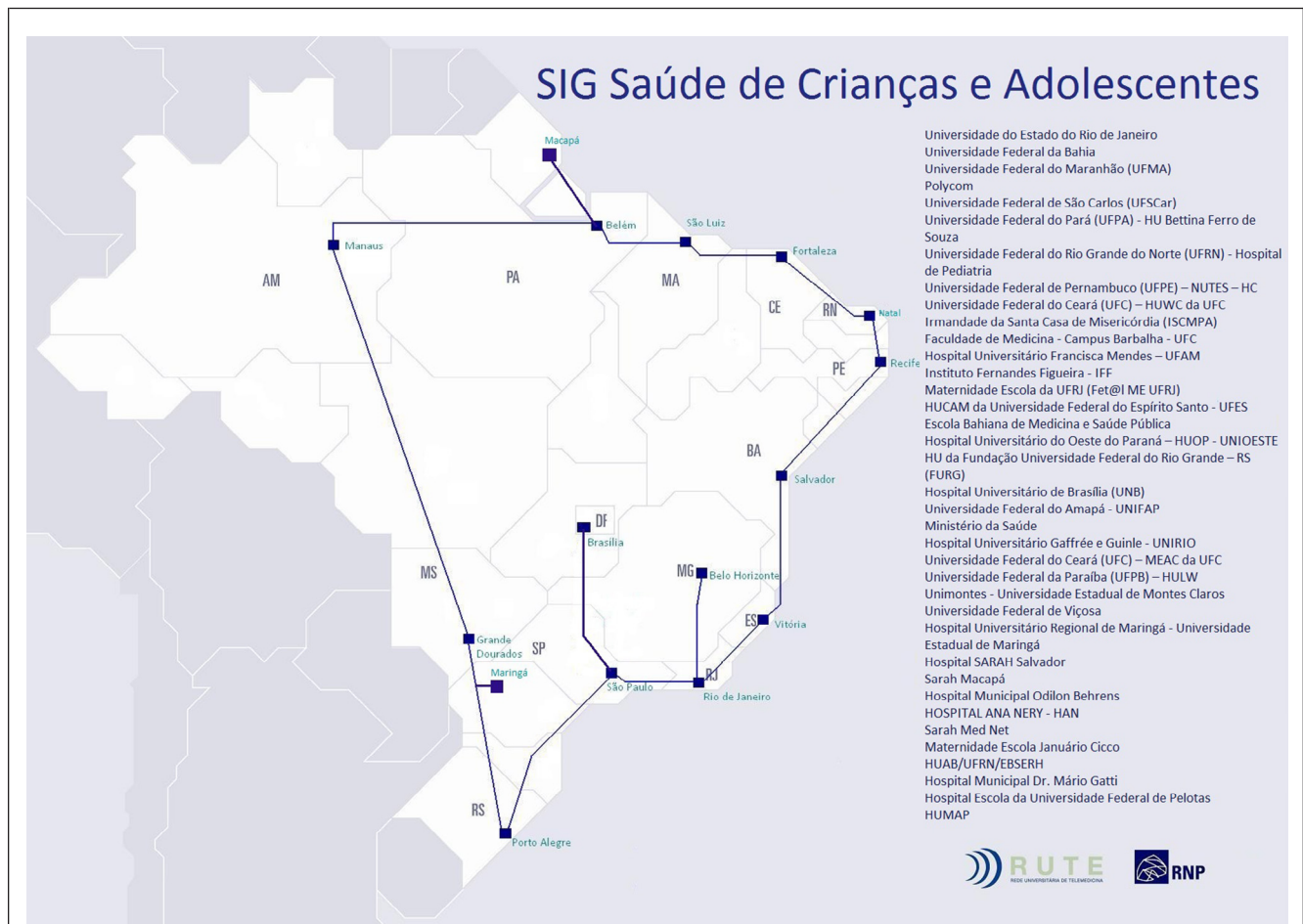
In addition, there has been a Global Scientific Community Health Network videoconference session with the participation of our SIG and the first global grand rounds at the Project MAGIC (Middleware for Collaborative Applications and Global Virtual Communities) with the participation of 10 countries (ie, Brazil, USA, Canada, Russia, Mexico, Japan, India, Egypt, Czech Republic, Moldavia).<sup>10</sup> There is also a Global Network of Institutions of Learning,

Research, and Extension on Nutrition, Food, and Nutrition Sovereignty and Security (NutriSSAN) being implemented.<sup>11</sup> The plan to network with the Comunidade dos Países de Língua Portuguesa (CLPL)—a community of 9 Portuguese-speaking countries to disseminate all the educational materials and videoconferences—is another example of broadening the frontiers of medical and health for adolescents in the world, to begin in September of 2017 (Figure 1).

## THIS DIGITAL WORLD

Brazil has established a safe and innovative space for the discussion of strategic issues related to the development of the Internet and its governance in the country. Throughout its development, the Brazilian Internet Steering Committee (CGI.br) played an important role for the global debate on Internet governance with the goals to support the formulation, implementation, and evaluation of public policies to foster the use of ICTs, with more open and transparent debate and planning of public policies to improve the Internet and to contribute to digital inclusion. Findings from a recent survey to map possible online risks and opportunities related to adolescent use of the Internet marked a significant transformation in how we think about the adolescent/ICT interface.<sup>12</sup>

Teenagers and young people are considered “digital natives” who have access not only to videogames but also to all kinds of programs and information. The ICT Kids Online-Brazil 2015<sup>13</sup> survey showed that Internet use via mobile digital technologies (MDTs) has become increasingly intense and frequent in the daily lives of Brazilian adolescents. This is consistent with data showing that 23 million people, or 79% of the Brazilian population in the adolescent age group, use MDT. Even among those who were connected, regional and socioeconomic differences still stood out. In urban areas, 84% of teens use MDT compared with 56% in rural areas. In higher and middle-class families, adolescent Internet use was practically universal (97%). In lower-income families, only half of adolescents were Internet users. Furthermore, Internet use took place primarily on mobile phones for high- and middle-income youth (85%), whereas 55% of low-income adolescents primarily used mobile phones. These results show the persistence of regional and socioeconomic inequalities that restrict the opportunities enjoyed by adolescents, which must be taken into account when promoting digital inclusion policies.



**Figure 1. Map of the Brazilian Universities and Medical Institutions that are members of the Special Interest Group for Children and Adolescent Health & Medicine of the Brazilian University Telemedicine Network, SIG-RUTE-BRAZIL, 2017.**

As a result, our SIG and a group of health professionals started networking with other university professors and professional digital lawyers, computing and informatics professionals, and several specialized educators, who came together to share knowledge and expertise on how to protect adolescents and young people on the Internet. Thus, in 2008 a new project was envisioned and called “This Digital World” in English; in Portuguese, it was known as ESSE Mundo Digital (E = Ethics, S = Safety, S = Health/Saude, E = Education).<sup>14</sup> Their first book was published about the health effects on adolescents connected to the digital world, called *Geração Digital/Digital Generation: Benefits and Risks of the New Technologies*.<sup>15</sup> Subsequently, a first international event occurred in Rio de Janeiro, April 2012, with the participation of 160 professionals from Brazil, Portugal, Spain, the United States, and Switzerland (World Health Organization) through a simultaneous triangle

high-tech videoconference (a videoconference with United States, Switzerland, and a whole group of Brazilian Health professionals in Rio de Janeiro, with a national transmission for many other States in Brazil spanning 3 continents (North America, South America, and Europe)). One of the outcomes of the event was the production of the second book entitled *Vivendo Esse Mundo Digital/Living in this Digital World: Impacts on the Health, Education and Social Behaviors*. The book had a positive impact, and it is available online.<sup>16</sup>

These debates and training sessions for health and education professionals address for prevention and early intervention include themes such as safety and privacy, cyberbullying, health effects of long hours online (eg, sleep disturbances), mental health problems (eg, anxiety, depression, technostress, Internet dependency), violence, suicide, sexting/grooming, risky behaviors (eg, choking during massive multiplayer

online role playing games), intolerance, discrimination, and hate speech at Internet social networks. It is important to highlight our (group of health professionals involved as members of the SIG) collaboration with the Center on Media and Child Health, in Boston, Massachusetts,<sup>17</sup> and MiudosSegurosNa.Net, in Porto, Portugal.<sup>18</sup> One example of a product born out of this collaboration is the document written with the support of the Scientific Department of Adolescence of the Brazilian Pediatric Society titled Health Risks of Children and Adolescents in the Digital Era. It is public and freely available since 2016, has had 8589 views online so far, and is considered the most accessed document of the site.<sup>17</sup>

As new frontiers open and as new uses for technology (eg, telemedicine) develop, opportunities continue to expand for education, training, and assistance in adolescent health, and professional health networks are an important bridge for connecting expertise with distant centers, globally. In November 21 and 22, 2017, our next international meeting and event will be convened in Rio de Janeiro.<sup>19</sup>

#### THE ADOLESCENT (ADOLEC) NETWORK

In the past 10 years, the *Revista Adolescência & Saúde* has published scientific literature on the themes of adolescent medicine and health, with publications freely available online in Portuguese and with English abstracts and key words.<sup>20</sup> So far, 616 papers have been published with 7 special supplements, with more than 3 million views from 56 different countries, mainly from Portuguese- and Spanish-speaking countries in Europe, Latin America, Africa, and North America. Again, the dissemination of medical knowledge and multidisciplinary expertise are highlighted due to the huge health demand for public information around adolescents.

The ADOLEC network is another example of a public online Virtual Health Library/Biblioteca Virtual em Saúde, sponsored by the Ministry of Health and linked to the e-Portuguese network for Portuguese-speaking countries. The ADOLEC-Brasil site is also viewed by teenagers and young people all over the world. Since 2012, this website has had 189,197 views,<sup>21</sup> and all materials, papers, publication, and information are shared among professional networks. Once a telemedicine topic is presented or there are new recommendations, policies, or medical alerts (eg, recent Zika and chikungunya outbreaks), all online network members interact to collaborate and share documents. Members are able to reach national

and international medical professionals almost immediately.

#### LESSONS LEARNED

- Professional commitment to share knowledge and scientific, practical, and up-to-date content is key to developing and implementing new trainings and to building capacity into adolescent medicine and health.
- Allocating available time for networking with other professionals is important.
- It is important to develop opportunities for interaction with centers of different communities with diverse social contexts and economic backgrounds.
- It is important to focus on the positive impact for medical students, interns, residents, staff, and multidisciplinary teams to learn and share concerns during the lively interaction and question-and-answer period at relevant encounters.
- There is a need to establish friendly, respectful, and professional networks.
- Ethical considerations are important when sharing consultations online or through videoconferences, especially regarding parental permission and legal considerations toward the clinical case being presented.
- Technical support and compatibility of information technology (IT) equipment are essential, and punctuality should be respected by everyone.
- Negative technical surprises are to be expected, such as lack of electric power, strikes, or viral threats online.
- Implementation of governmental policies is necessary to support the dissemination of University Health Telemedicine networks, not only for health rights toward adolescents but also as a priority for health equity toward this age target group.
- The accumulated experience should be leveraged to create a governance model for scientific communities and collaborative networks to broaden participation and expand the frontiers of health and education globally.

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