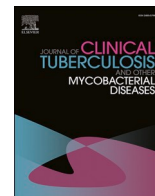




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Tuberculosis Scientific Conferences in Peru: Sharing local evidence for local decisions

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ABSTRACT

Introduction: International conferences on tuberculosis (TB) have been held since the 19th century. In Peru, the TB Scientific Conferences have been held annually in Lima since 2013 as a means of developing a national TB research network and setting the stage for researchers and institutions to present and share new findings from studies conducted in Peru.

Methods: Systematization of information on speakers and presentations from TB Scientific Conferences in Peru. Presentation files and official agendas for the conferences from 2013 to 2019 were obtained from the Tuberculosis Prevention and Control Directorate's website.

Results: A total of 426 scientific presentations have been delivered by 230 speakers, with a steady annual increase. 37.1% of the talks were given by female speakers. To date, 61.4% of the research presented has been published. Out of all the studies, 10.9% (30/275) were part of international, multicentric research projects. Main research lines were epidemiology (40.1%), drug-resistance (29.6%) and treatment (22.1%).

Conclusions: TB Scientific Conferences serve as a platform to share region-specific TB evidence between local stakeholders (health officials, academics, and others) who aim to facilitate the implementation of measures with the goal of reducing the national gaps towards the End TB Strategy goals.

1. Introduction

International conferences on tuberculosis (TB) have been held since the mid-19th century, when no organism had been linked to the disease yet [1]. A few decades later, Robert Koch presented his discovery of the tubercle bacillus at a conference in Berlin [2]. Since then, many important advances in TB research have been reported at conferences around the world. The International Union Against Tuberculosis and Lung Disease was established in 1920 and held its first conference in Paris. Following the inaugural event, 51 Union international conferences have been held at various venues around the world (including a virtual conference in 2020), where scientific and programmatic advances in the fight against TB are discussed [1].

In World Tuberculosis Day of 2015, former United Nations Secretary-General, Ban Ki-moon, stated that “efforts must begin now to ensure the effective global roll-out of the End TB Strategy and to stimulate the research

that will underpin its success” [3]. The focus of the third pillar of the End TB Strategy, *Intensified research and innovation*, lies on the discovery and development of new tools, interventions, and strategies which aim to shift the direction of the epidemic in order to reach the goals set by 2035 [3]. In order to achieve TB eradication, the need for novel research and findings must be met. Coincidentally, findings must be widely communicated and further applied across regional contexts.

In Peru, the Tuberculosis Prevention and Control Directorate (DPCTB), the office which is governed under the Ministry of Health (MoH), is designated to lead the fight against TB. The World Health Organization (WHO) estimates that in 2019 around 39 thousand active TB cases were registered in Peru, with an incidence of 119 new cases per 100,000 inhabitants [4]. Most of the cases (59.3%) were registered in Lima Metropolitan Area [5]. Additionally, Peru is currently in the WHO list of high 30 MDR-TB burden countries for the 2016–2020 period; this stems from the high incidence rate rather than the absolute number of

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cases [4]. In Latin America, Peru ranks first in the number of reported cases of MDR-TB, while Brazil leads with the highest estimated incidence and TB/HIV burden [6].

Under DPCTB leadership, various research institutions joined to organize the national conference on TB; these include: Instituto de Medicina Tropical Alexander von Humboldt at Universidad Peruana Cayetano Heredia (UPCH) (a non-profit, private university), Instituto de Medicina Tropical Daniel Alcides Carrión at Universidad Nacional Mayor de San Marcos (a public university), Sociedad Peruana de Neumología (SPN, a professional clinical society), Sociedad Peruana de Enfermedades Infecciosas y Tropicales (SPEIT, a professional clinical society), Partners in Health (an NGO), the National Health Institute (INS, a public institution at MoH), among others. Since 2013, TB Scientific Conferences have been annually held in Lima to set the stage for researchers and institutions to share new findings and results from studies done in the country. Moreover, national policies have facilitated further TB research; for example, Law 30,287 Article 37 [7], on TB control and prevention, that was passed in 2014, necessitates the prioritization of TB research by regional governments and educational institutions. As a result, a nationwide TB research network was incorporated in 2016, which is now in charge of organizing the TB Scientific Conferences with efforts and resources provided by the member institutions. The contents of the conferences are chosen by this network and are based on research priorities established a priori. By 2019, only two other countries in South America (Brazil and Colombia) had incorporated a similar TB research network as laid out by the third pillar of the End TB Strategy. Additionally, Article 38 requests the INS to facilitate an expeditious approval process for TB studies [7]. Likewise, the MoH and INS have identified the national research priorities for TB, to obtain local evidence for an efficient stride towards TB control in Peru [8].

All assets and barriers faced in the wake of the fight against TB in Peru are shared at the conferences; dynamic discussions are led by a number of stakeholders, such as the government, private health sector, academia, and the civil society which includes patients' associations. The study aims to give a broad overview of the presentations given at the TB Scientific Conferences evaluating speaker participation, diversity of presentation topics and, its benefit towards TB control.

2. Material and methods

Official agenda and presentation files for the first seven (2013–2019) Peruvian TB Scientific Conferences were obtained from the DPCTB's website [9]. Due to poster presentations not being implemented in the early conferences or available on the website, they were not included in the analysis (most of the poster presenters were medical doctors, nursing and other health sciences undergraduate and postgraduate students). The general information about the speaker's name, sex, institution, affiliations, country, and profession was recorded. Presentations were tagged according to preset categories including treatment, diagnostic, drug-resistance (including mono-resistance, MDR-TB and XDR-TB), genetics, treatment adherence, pediatrics, nutrition, comorbidities, epidemiology (mainly focused on prevalence, regional distribution and identification of risk factors), molecular biology, immunology, and others. Presentations could encompass more than one category. The presentations were categorized as either lectures, which gave a thorough overview of a topic on TB, or study specific, which focused on results of research conducted. For the latter, additional information was obtained including study design and journal of publication. Following information gathering, descriptive analysis with frequencies and percentages was obtained. The study did not require an ethics approval as it did not include confidential personal information.

3. Results

A total of 426 scientific presentations have been delivered in the first

seven editions of TB Conferences. The number of talks has steadily increased from 32 to 95 in 2013 and 2019, respectively (Fig. 1). Over 230 speakers have been invited to participate, among them 48 international speakers, most from the United Kingdom ($n = 21$, 43.7%, of which two speakers gave six and five talks, respectively) and the United States ($n = 18$, 37.5%). Approximately a third (37.1%) of all talks were given by female speakers. There were 135 female Peruvian speakers (35.9%) compared to 22 female international speakers (45.8%).

Most speakers were medical doctors (62.2%), followed by biologists (17.1%), and registered nurses (12.8%). Other professions included medical technologists (4%) and psychologists (2.1%). There have been no presentations made by TB survivors/advocates. Institutional presence in the conference is shown in Fig. 2.

Among the presentations that reported study results, 61.4% have been published to date. On average, 25 published articles were presented each year. The most represented study designs were cross-sectional (32.9%), retrospective (23.2%) and prospective cohorts (19.3%) (Table 1). All studies were conducted in Peru and 10.9% ($n = 30$) were also a part of multicentered, international studies. The presentations mainly covered topics on epidemiology (40.1%), drug-resistance (29.6%) and treatment (22.1%) (Fig. 3).

4. Discussion

The annual TB Scientific Conferences in Peru have been an important platform for over 230 speakers who delivered a total of 426 talks while covering a wide range of TB-related topics. The yearly rise in talks correlates to the increasing number of publications on TB that have been authored/co-authored by Peruvian researchers [10,11].

In order to improve the quality of TB care, research results should be made available to healthcare providers and policymakers [12]. Among changes in the positive direction, the participation from the Peruvian TB health workers as well as international collaborations are increasing, especially external participation within the institutions that prioritize TB research. For instance, UPCH and SES excel yearly supporting the conferences as members of the planning committee and their contribution can also be observed in the presence of their international collaborators; principally the London School of Hygiene and Tropical Medicine, Imperial College London, and Harvard University [10]. A recent study suggested that sustained, long-standing international partnerships promoted and built research capacity in Peru [13]. The annual number of publications increased 9-fold in a 20-year period

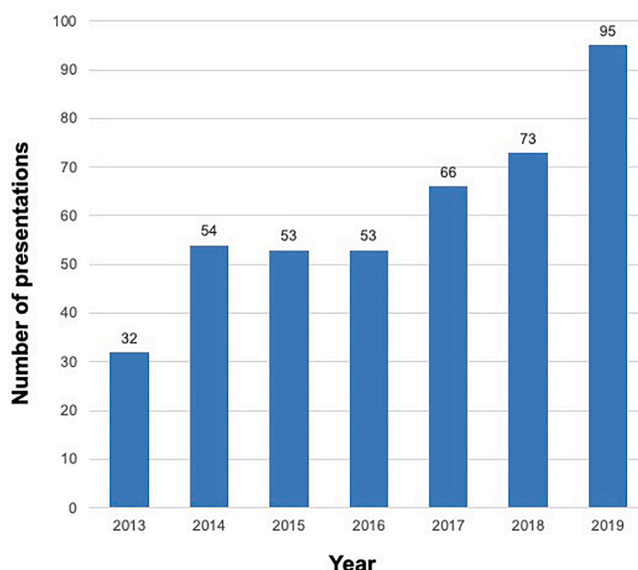


Fig. 1. Number of presentations at the TB Scientific Conferences per year.

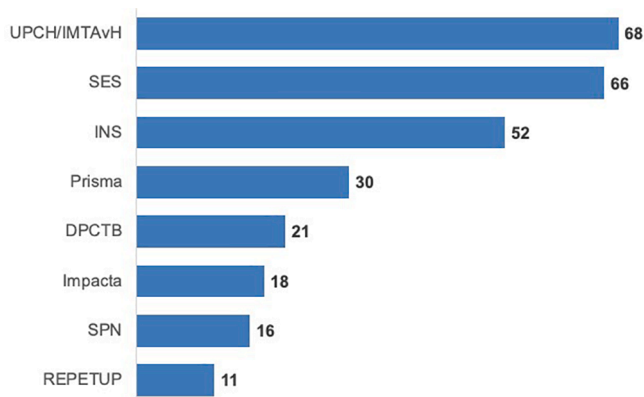


Fig. 2. Number of presentations at the TB Scientific Conferences per institution. UPCH: Universidad Peruana Cayetano Heredia. IMTA vH: Instituto de Medicina Tropical Alexander von Humboldt. SES: Socios En Salud (Partners In Health). INS: Instituto Nacional de Salud (National Institute of Health). DPCTB: Dirección de Prevención y Control de Tuberculosis (Tuberculosis Prevention and Control Directorate). SPN: Sociedad Peruana de Neumología (National Pulmonology Society). REPETUP: Red Peruana de Tuberculosis Pediátrica (Peruvian Network of Pediatric Tuberculosis).

Table 1
Study designs presented at the TB Scientific Conferences.

Study design	N
Cross-sectional	65
Retrospective cohort	52
Prospective cohort	50
Case-control	22
Clinical trials	13
Quasi-experimental	7
Case series	4
Case reports	4
Systematic reviews	3

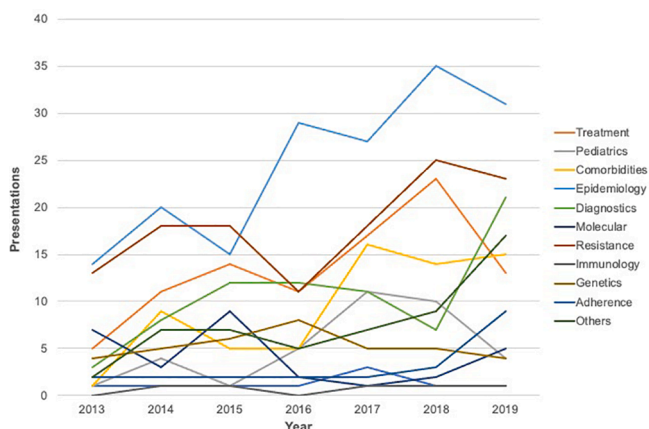


Fig. 3. Topics covered by presentations at the TB Scientific Conferences.

characterized by the securement of partnerships and TB was among the main research areas that benefited during the seven-year period [13]. The partnerships have greatly served the TB-affected population. For example, Partners in Health, (local branch is known as Socios en Salud or SES), have treated more than 10,500 people with drug-resistant TB in the 20 years of service in Peru and have managed to achieve cure rates of 75% while conducting research in close proximity to the DPCTB [14].

A study shows that the proportion of female speakers at medical conferences tend to be lower than that of males, averaging at 30.1%

[15]. Although there has been an average 31% yearly increase in the number of female speakers (from 10 female in 2013 to 37 in 2019), the ratio remains unchanged (2 male speakers for every female speaker). However, this is not the case when differentiating between national and international speakers, where in the latter sex disparity is not as pronounced. Sex balance must be practiced during the scheduling of the event in order to ensure that the female community is adequately represented, especially considering that women constitute more than half of the healthcare workforce [16].

Overall, the number of talks and presentations has been continuously increasing which is also reflective of the increase in TB-related research done in Peru. A PubMed search on “Tuberculosis” and “Peru” per calendar year shows a similar increase in the last 10 years. Approximately two-thirds of talks presented preliminary or published results of TB studies, whereas the rest were composed of grand lectures, which included an annual report by the head of the DPCTB highlighting the results of the year’s efforts to control TB. The TB Scientific Conferences serve as a way to present the local efforts towards the goals of the End TB Strategy by 2035: 95% reduction in the number of TB deaths, 90% reduction in the TB incidence rate and 0% of TB-affected families facing catastrophic costs due to TB [3,17].

Epidemiological studies accounted for almost half of the overall topics covered by the annual presentations, highlighting the importance of understanding the current state of TB healthcare in Peru as well as the necessity to conduct new research studies and strategies to tackle the current obstacles, for example treatment adherence (22 presentations). Learning among whom, where, and how a disease spreads is at the core of every infectious disease epidemic and it is one of our main arsenals against TB [18]. While there has been a slight decrease in TB incidence rate (-3.5% change between 2015 and 2019), there has been worrying incline in the average annual rate of change in the percentage of new TB cases which are MDR-TB (+7% change between 2010 and 2019) [4]. This seems to have been recognized and presentations on drug-resistance and treatment are common in the conferences as researchers have a keen interest in pursuing and testing new drug regimens that are urgently needed. Clinical trials that have been presented in the conferences often include the MDR-TB population and the search for safe, tolerable, and injectable-free regimens [19]. All information generated by the studies aids in the revision of local diagnostic and treatment guidelines which considerably improve the focus on at-risk populations [20].

A key feature of the conferences is that all presented data on TB studies have involved the Peruvian population; either the study, in its entirety, was conducted in the country (89.1%) or it was part of a multicentered, international study (10.9%). Cross-sectional studies are the predominant study design presented at the conferences followed by longitudinal studies with a slight preference towards retrospective studies. The proportion of study designs is consistent with the available publications accessible through a bibliometric analysis on TB research in Peru [10]. However, randomized clinical trials (RCTs) and systematic reviews represented a relatively low percentage of research work on TB. Clinical trial platforms in Peru work closer with DOT centers in health units, and the pragmatic approach allows for a feasible transition to treatment implementation when a drug is approved.

Although the amount of research has been increasing, not all studies are published in scientific journals in order to enhance TB knowledge. One systematic review shows that more than half of results from abstract at scientific meetings fail to be published in full and this is especially the case for “not positive” results and for non-native English-speaking countries, whom are facing language barriers [21]. While the medical journal from the INS, *Revista Peruana de Medicina Experimental y Salud Pública* [22], publishes manuscripts at no cost for the authors, researchers from Peru might face difficulties when opting to publish in international journals due to elevated costs as is described in other LMIC settings [24]. Moreover, research published in Spanish or other non-English languages poses a barrier towards capacity building and,

ultimately, global health development [23]. “Intensified research and innovation” is identified as the third pillar of the End-TB Strategy and, therefore, we should strive to increase availability of study results either by publishing data in a journal or as an open-access format. Research production and publishing allows for further partnerships to be formed and studies to be implemented which conclusively strengthens health systems [24].

As we enhance the knowledge of TB healthcare workers with novel data, we must also begin communicating them to the general population, and more actively including presentations from TB survivors/advocates, patient associations and civil society in the presentations. This rich interaction between all parties will ultimately help to focus on needed research lines, improve studies approach and urgent problems faced in TB care [25]. TB is one of the best examples where a patient-centered approach can lead to treatment success, and a platform for patients and health workers can be a great place for sharing impressions and identifying gaps and barriers [3]. Furthermore, the interaction can help to improve health literacy among the population regarding TB. For example, prior studies show how lack of TB-related knowledge was associated with disease recurrence, suggesting that health education may improve prognosis [26]. Additionally, another study found that 30% of outpatients were not aware that cough was a symptom of TB and an alarming 70% were not aware that being in contact with a TB patient was a risk factor for TB [27]. Intensifying health education aimed at the population will raise awareness and ultimately serve as a protective factor in the fight to control TB in Peru.

The main limitation to be addressed is that quantity does not equal or imply quality. Due to the diversity of how the presentation were elaborated, some give more details in regard to their methods than others; therefore, assessing the quality with the use of validated scales, such as those used for poster presentations was not feasible [28]. Presentation guidelines will be suggested to allow for the application of scales and evaluation of quality in the years to come. While a systematic assortment of the presentations in the TB Scientific Conferences generated valuable information on research presented, it failed to grasp the impact of discussed research when it comes to capacity building, collaboration strengthening, or implementation into local and international guidelines. Important to note is that operational research, which blends into the usual functioning of the TB Program, is scarce as well as it is underfunded [29]. Operational research and implementation science should start playing a major role in TB Scientific Conferences as their results are associated with the improvement of healthcare services and are a way towards the fulfillment of the End TB Strategy goals [30,31].

It must be stated that exhaustive efforts and complex logistics are required to host the conferences discussed in the manuscript. Annually, over 500 participants from all over Peru attend the conference. However, like other events around the world, the conferences were cancelled due to the COVID-19 pandemic. Online solutions will be explored for later years allowing for a greater and more diverse audience.

5. Conclusions

TB Scientific Conferences in Peru are an annual outstanding effort from the DPCTB and other affiliated institutions to gather all novel TB research under one roof and following the third pillar of the End TB Strategy (*Intensified research and innovation*). It serves to know the current state of TB and what is missing from our efforts towards the End TB Strategy goals. The conferences have shown substantial growth with increased participation of national and international speakers which goes on par with the increasing level of TB research being published in Peru.

Efforts must be made in order to encourage participation of local researchers, especially those working in operational research and implementation science settings. Additionally, the results could be highly valuable for discussion and future implementation into the TB Program guidelines. The conferences must be continued or expanded,

either by adapting the mode of delivery to accommodate for digital participation and attendance or by facilitating a wider stage once it is possible to share our findings in person again.

Ethical statement

The study did not require an ethics approval as it did not include confidential personal information.

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CRediT authorship contribution statement

Alvaro Schwalb: Methodology, Formal analysis, Investigation, Data curation, Writing - original draft. **Rodrigo Cachay:** Methodology, Investigation, Data curation, Writing - original draft. **Maricela Curisínche-Rojas:** Resources, Writing - review & editing. **Eduardo Gotuzzo:** Writing - review & editing. **Julia Ríos:** Writing - review & editing. **César Ugarte-Gil:** Conceptualization, Methodology, Supervision, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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