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The evolution of syphilis and gonorrhoea infection rates in Ecuador over the last 20 years is affected by data collection, health budget and control campaigns

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Abstract

The aim of this study was to publish the available statistical data regarding sexually transmitted diseases (STDs) in Ecuador from the past 20 years, highlighting the evolving prevalence of syphilis and gonorrhoea.

We observed a decrease of syphilis and gonorrhoea after the recession of 1999, that led to the introduction of the United State dollar (USD) as the official currency. At that time, several doctors had reported the lack of medicines and tests for the detection and treatment of these diseases, which might have played an important role in the temporary increase of these diseases subsequently in 2000-2001. However, the cases of STDs decreased after 2002, which coincided with the inauguration of a new President, whose government had increased considerably the investment in the public health sector. Currently, the reported cases of syphilis are considerably higher than gonorrhoea, opposite to what is happening in other parts of the world. The places that reported highest cases of syphilis and gonorrhoea are the areas that promiscuity has been also reported.

Furthermore, because doctors are not required to report STDs, high number of self-medicating patients and empiric treatment may partially accounted for the decline observed in reported cases of syphilis and gonorrhoea. To fight these two diseases and be assured of the effectiveness of the control campaigns, it is necessary to make STDs obligatory reportable diseases and to cease uncontrolled access to antibiotics. Otherwise, the data does not reflect the reality of the STDs epidemic in Ecuador.

Keywords: Syphilis, Gonorrhoea, Sexually transmitted diseases, Ecuador, Control campaign, Infection rates, Obligatory declaration

Introduction

Even though informative and protective approaches against sexual transmitted diseases (STDs) have emerged, statistics prove that these health-threatening issues still represent a major concern. Gonorrhoea, one of the most frequently reported STD is caused by the bacterium *Neisseria gonorrhoea* and commonly manifested as urethritis, cervicitis, proctitis, salpingitis, or pharyngitis [1]. The World Health Organization (WHO) has called for a global action plan to control the spread of *Neisseria sp.* [2,3]. Syphilis is a complex sexually transmitted disease that has a highly variable clinical course. The PAO (Pan-American Health Organization) estimates the overall prevalence of syphilis among pregnant women in South America to be around 3.1% [2,4].

Factors that determine the persistence of congenital syphilis and gonorrhoea as public health problems include a lack of awareness of the seriousness of the problems among politicians and health officials. In 2011, Ecuador spent 4 Million USD in order to create an awareness program about STDs called "Talk seriously, sexuality without mystery" to educate the public regarding the spread and consequences of STDs.

The aim of this study was to evaluate the situation of Ecuador with respect to the most common STDs caused by bacteria in this area, namely syphilis and gonorrhoea, and to assess the effectiveness of the recent control campaigns that the government of Ecuador had implemented to decrease the STDs rates. This retrospective studies examined the clinical cases of syphilis and gonorrhoea reported from 1994 to 2014 and is the first study of this magnitude performed in Ecuador.

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Methods

The retrospective study was based on clinical data gathered from cases reported by medical doctors to the Epidemiological Surveillance Department of the Ministry of Public Health of Ecuador (14,483,499 million people in 2010). All the data used for this study were approved by the ethical committee of the Ministry of Public Health. The comparisons made between different areas are based on officially reported cases for each zone. The data is available on line in the Ministry website. Data of the control campaigns were obtained from paper files supplied to the authors by the Economy Department of the Ministry of Public Health of Ecuador (these data are not available on line, but can be obtained by contacting the authors).

Statistical tests were performed using the StatPac software and by T-test (two samples t-test between percentages).

Results

There are three different bacterial (STDs) that are the most prevalent worldwide: syphilis, gonorrhoea and chlamydia. However, in Ecuador we have encountered significant data just for syphilis and gonorrhoea (no such data was available on chlamydia). Although not obligatory, some health centres report the cases of STDs to the Ministry of Public Health.

In our analysis, we observed that after the 1999 recession there was a significant decrease in the reported cases of STDs. In 1999 Gonorrhoea rate was 54.31 per 100.000 inhabitants and in 2002 was 35.53 which is statistically significant (<0.001). In 2014 the rate was 5.12, which is also a significant reduction of the prevalence of this infectious disease (<0.001). These results reveal the efficiency of the campaign and control measurements. The interviewed medical representatives explain that because of the lack of medicines and efficient diagnostic test, many actual cases of syphilis and gonorrhoea may not be detected and reported on time. They suggest that this aspect significantly accounted for the decrease in the incidence of both investigated STDs during 2001 and 2002.

The second decrease of the reported cases of these STDs was observed when Rafael Correa became the President of the Republic of Ecuador. During his government, the investment in the Public Health was considerably increased by 4 million USD and this fact was accompanied by the launch of the first campaign to decrease and eradicate STDs in Ecuador in 2011. These measures had an immediate effect that greatly decreased the incidence of these STDs.

Currently, in contrast to other countries such as Spain, the number of reported cases of syphilis are higher than in Ecuador. Geographical analysis of both STDs showed a higher number of reported cases on the coast area, Amazonia and Galapagos Islands, which are also the areas with higher reported promiscuity and unprotected sex (Figures 2-4). Gonorrhoea is still affecting primarily the Galapagos Islands and coastal area. In 2012, a total of 1207 cases of gonorrhoea were reported. Among these, 985 were from the coast (mainly in the area of Guayas), 123 in the Amazonia (mainly Morona Santiago) and the remaining numbers in the Andean region. For the past 20 years Guayas has been the worst affected region. The reported cases in women were upto three times more frequent than in men (972 cases reported in woman versus 235 in men). On the other hand, the incidence of syphilis reported cases appears to be variable, and a significant increase was observable in the last few years (Figure 1). Three

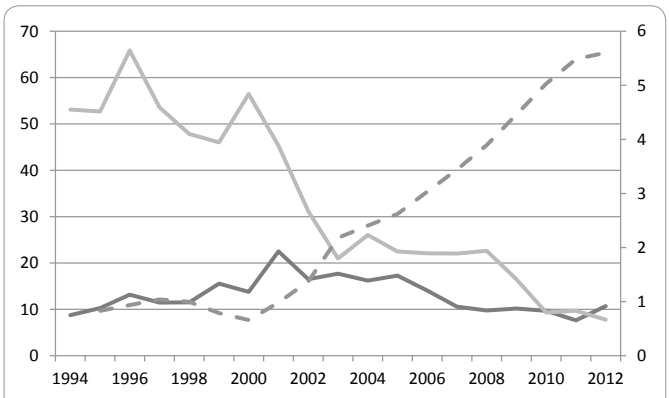

Figure 1: The evolution of syphilis and gonorrhea infection rates in Ecuador over the last 20years depending on the invested budget. (Left Y-axis) Rate of Syphilis (Black line) and Gonorrhea (Gray line) per 100.000 inhabitants in Ecuador since between 1994 until and 2012 (Left Y axis).(Right Y axis) Evolution Changes in of the health budget of Ecuador from between 1995 - until 2012 in thousands of millions USD (Right Y axis).

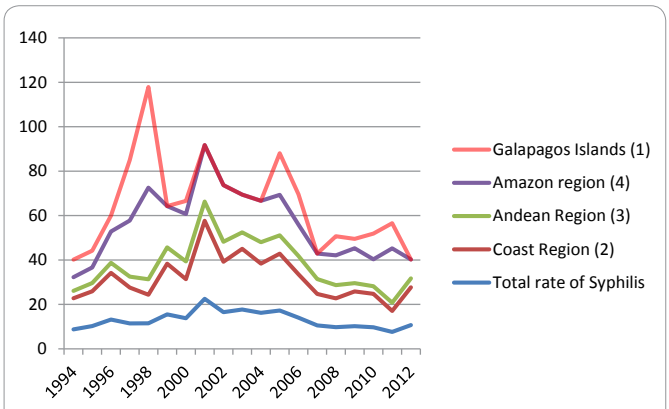

Figure 2: Rates by 100.000 inhabitants of Syphilis. This figure shows the total rate and the rates by different areas of Ecuador; Galapagos islands (1), coastal region (2), Andean region (3) and Amazonian region (4). The numbers sow the position in the map (Figure 4).

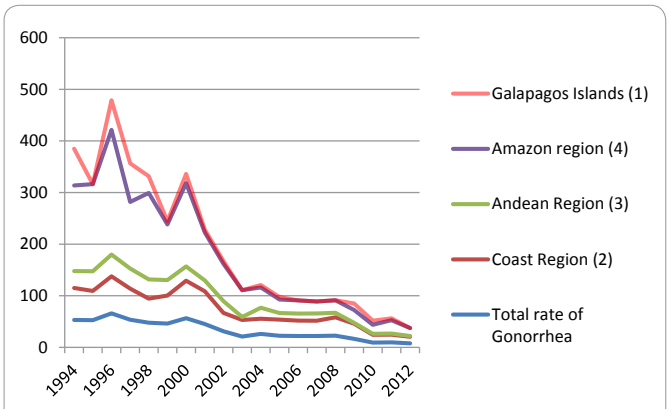

Figure 3: Rates by 100.000 inhabitants of Gonorrhea. This figure shows the total rate and the rates by different areas of Ecuador; Galapagos islands (1), coastal region (2), Andean region (3) and Amazonian region (4). The numbers sow the position in the map (Figure 4).

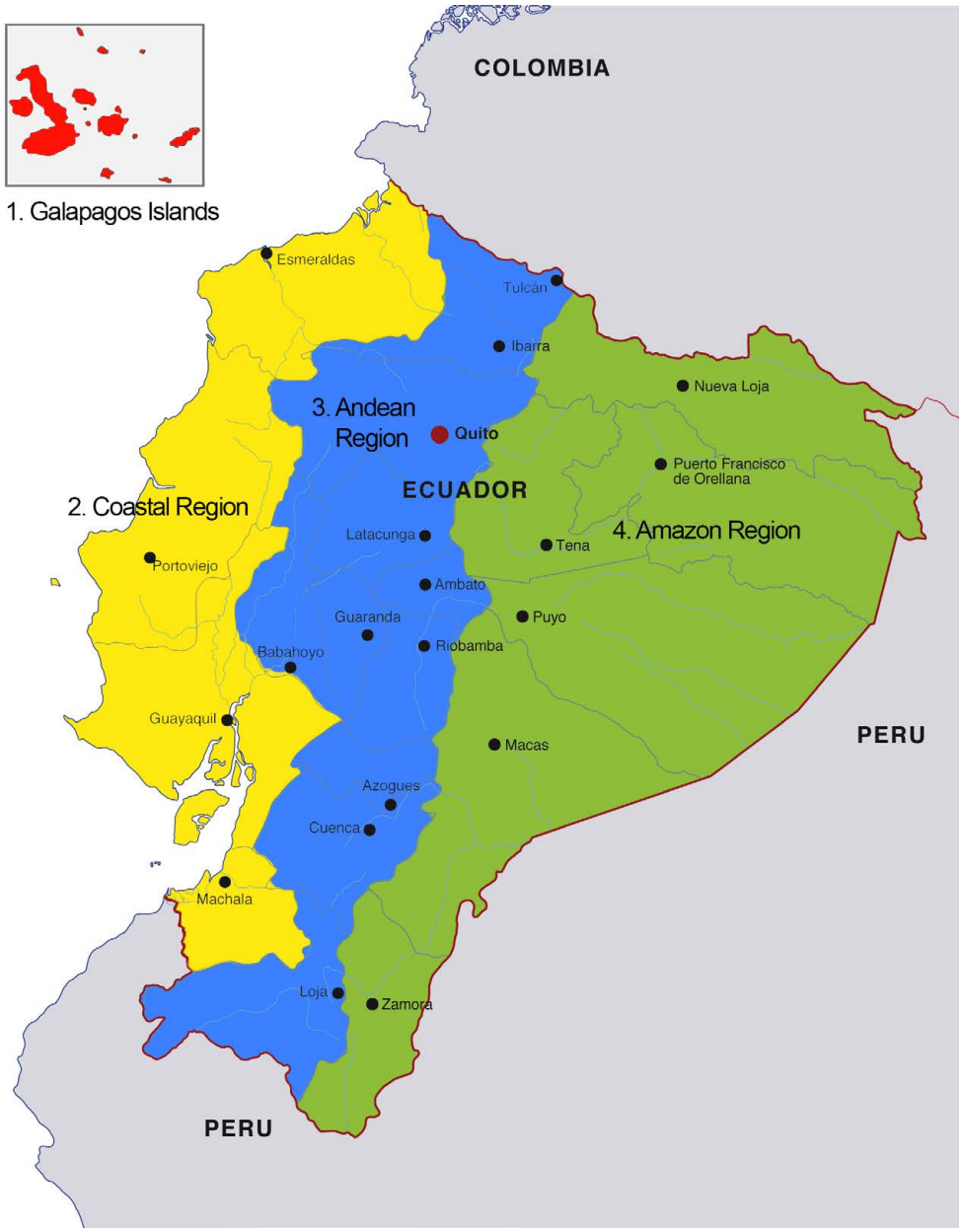

Figure 4: Map of Ecuador divided by areas.

important outbreaks occurred in 1998, 2001 and 2005. In 1998, the outbreak affected mainly the Sucumbíos area in the Amazonian region. In 2001, the most affected area was Los Rios, which is part of the Ecuadorian coastal region. Finally, the last important outbreak was observed again in Los Rios area. The last outbreak was the most significant, affecting twice as many women as men.

Discussion

Even though the incidence of STDs has decreased since 2001, they are still affecting some areas of Ecuador. An improvement in sexual health education is still needed in Ecuador to reduce not only the number of STDs, but as well teen pregnancy rates. In this work we studied the relationship between the number of reported cases of syphilis and gonorrhoea and the effect of the control campaign that was launched in 2001. We separately analysed each significant area of Ecuador as the opportunity of sex education is different in different regions of the country.

There were two major limitations in this study. One was that the number of actual cases was impossible to be estimated, as young people were likely to be embarrassed to acknowledge to have contracted a STD. Most often, they treated themselves traditionally, or went to a local pharmacy for a treatment without a specialized medical intervention. In places with an overriding indigenous culture, many went to the shaman, which probably caused further underestimation of the numbers. Secondly, an

obligatory reporting protocol for STDs has not been instituted yet in Ecuador.

Our data revealed that the rate of gonorrhoea is decreasing in Ecuador, contrary to other countries, such as the US where the rate of gonorrhoea is increasing [2]. However, it should be clearly stated that this estimation could be influenced by many underreported cases. The decrease in the number of cases of gonorrhoea reported in 2008 showed an improvement in sex education spearheaded in Ecuador. In addition, in 2008, the budget for diagnosis was increased which resulted also in significant improvements of the diagnosis methods. In 2005 the rate by 100.000 inhabitants for gonorrhoea was 17.27 and in 2008, 9.76, this difference being statistically significant ($p<0.001$). Similar to countries such as Sweden or Peru, the homosexual community in Ecuador present a higher incidence rate of STDs [5,6]. Worldwide, the rate of syphilis is not under control; some countries are heavily affected and outbreaks have been reported. This may be due to the fact that this disease is asymptomatic until it is in an advanced stage. For example, it was reported to affect more than 12 million people in 1999, among which 90% were from developing countries [7]. There are reports that show differences in the prevalence of this disease depending on the race and sex. It seems that the Hispanic race is more resistant to the infection [8], but the fact that the declaration of this infection is not mandatory in Ecuador means that it would be misguided to assume that natural resistance may be the explanation for the decrease in reported cases. But STDs are not just a problem in developing countries, but also in developed nations. Since mid-1990, the increase in incidence of STDs has been remarkable [9]. Some studies showed that young Europeans have low awareness about some STDs, even though sexual education is part of the high school curriculum. A study of Samkange-Zeeb et al. revealed that the usage of condom is really low among European adolescents and young adults [9]. Moreover, researchers concluded that condoms are primarily used to avoid pregnancy not STDs. This attitude is compounded by the lack of awareness about STDs transmission [10]. Thus not surprisingly in Ecuador, where the culture of the general population is religiously conservative and sex education is still a taboo subject, statistics of STDs are much worse, even with all the effort that the government has invested into the control campaigns since 2011. Similar to Ecuador, Latin America as a whole is heavily affected by STDs. In Peru and Brazil, it has been reported that the increase in the STD infection is related to high risk behaviours, including the consumption of drugs and alcohol in teenagers and young adults [11,12].

In Ecuador, the second most common reason for visiting accident and emergency in the hospital is miscarriage caused by STDs [12]. It is important to highlight that most cases of STDs are treated empirically and without doing the isolation of the microorganism. The high rate of pregnancy in teens and STDs in Ecuador and other Latin American countries are major problems that need to be addressed. Surveys taken from eight countries (Bolivia, Brazil, Colombia, Dominican Republic, Guatemala, Nicaragua, Paraguay and Peru) conducted between 1990 and 2000, showed that premarital sexual activity has increased [13,14]. These studies also showed the increased usage of condoms, although the contribution of condom use as contraceptive protection represented only 10-20% of all contraceptive methods.

Conclusions

In this work we revealed that Ecuador is the country with the highest rate of STDs in Latin America. The higher incidence rates of these diseases in Ecuador corresponded to regions with poorer availability of medical care and education, including the Amazon and coastal regions. The government is investing 8 million USD a year to improve the situation, but the fact that in Ecuador there is a high proportion of the population that have conservative religious beliefs makes success more difficult. For example, in the campaign of 2011, Ecuadorians protested against the campaign because of open discussion about sex. However, an improvement was clearly noticed in urban areas where the level of general education is higher. In rural areas where the children help the parents with their jobs rather than going to the school, the situation needs rapid improvement. Currently, the Ecuadorian government is making big investments in programs to improve the education and to implement a safe sex mentality. Again, some sections of the population do not support these campaigns as they think sex should not be an openly discussed topic.

There are still questions that should be studied, for example the rate of other STDs like Chlamydia, HPV and their relationship with HIV. Also, it is important to have more clinical data from indigenous regions of Ecuador, including the Amazon or some of the Andes areas, as they might be more reluctant to talk openly about their sexuality and contraception practices. Studies in to auto-medication in reference to STDs will provide valuable information as to reveal a closer representation of STD rates and to the reasons why auto-medication is so prevalent. Studies about antibiotic resistance among bacterial pathogens associated with STDs need to be performed, since the available data is minimal regarding this aspect. More campaigns on safe-sex practices need to be launched in Ecuador, as well as educating the public in talking about sex more openly and without taboos which goes hand in hand with a safer sex practice. Lastly, we suggest implementing a protocol that stops the practice of empiric treatment and obligatory declaration of STDs in Ecuador, which in addition to syphilis and gonorrhoea, will also include Chlamydia. Without the implementation of such procedure any analysis of the data or evaluation of campaigns can be misleading or be misinterpreted due to the lack of reporting.

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Discloser Policy

The authors confirm there is no conflict of interest for the publication of this paper.

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