# Poverty, Folate Deficiency, Human Immunodeficiency Virus and Ulcerated Vulval **Sexually Transmitted Diseases in Jamaica**

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# ABSTRACT

Sexually transmitted genital ulcerative conditions are declining in Jamaica. The rates at present are far lower than that seen in the 1950s – 1960s. Review of the records of the national Comprehensive Clinic has revealed that all of the major sexually transmitted conditions (Syphilis, Lymphogranuloma Venereum (LGV), Chancroid, Granuloma Inguinale and Herpes Simplex) have declined but have had three peaks between 1958 and 2000. Closer review seems to suggest that the peaks were associated firstly with poverty in the 1960s and 1970s and to the HIV epidemic in the 1980s and early 1990s. There are also smaller spikes which appear to be associated with periods of environmental disasters, with a possible association with folate deficiency. This is apparent for the bacterial and chlamydial conditions as well as viral conditions such as Herpes simplex.

Keywords: Poverty, HIV, STD

# Pobreza, Deficiencia de Ácido Fólico, Virus de la Inmunodeficiencia Humana, y la Ulceración de la Vulva por Enfermedades de Transmisión Sexual, en Jamaica

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# RESUMEN

Las condiciones ulcerativas genitales transmitidas sexualmente están disminuyendo en Jamaica. En el presente, los índices son muchos más bajos que los observados en la década de 1950 y 1960 respectivamente. La revisión de los archivos de la llamada Nacional Comprehensive Clinic ha revelado que todas las condiciones principales (sífilis, linfogranuloma venéreo, chancroide, granuloma inguinal, y el herpes simple) han disminuido. No obstante, ha habido tres puntos críticos entre 1958 y 2000. Un examen detallado sugiere que estos picos estaban asociados primeramente con la pobreza en los años 60 y 70, y la epidemia de VIH en la década de los 80 ochenta y principios de los 90. Hay también pequeñas alzas que parecen estar asociados con periodos de desastres medioambientales, así como con una posible asociación con la deficiencia de folato. Esto es evidente en el caso de las condiciones bacterianas y clamidiales, así como las condiciones virales tales como la que representa el herpes simple.

Palabras claves: Pobreza, VIH, SDT

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are more common in low socio-economic regions, with the

majority of new cases of HIV infection in the world being

reported in underdeveloped or developing countries (3) and

disproportionately more common in certain ethnic groups (4, The stigmata of promiscuity, irresponsible sexual

practices and loose morals attached to these persons are

common but probably unfair, as other factors such as those

# **INTRODUCTION**

The sexually transmitted genital ulcerations are important, as the presence of such lesions increase the risk of HIV infection (1, 2). Sexually transmitted infections including HIV,

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There are reports that the high prevalence of these ulcerated diseases may be linked to low socio-economic status (5, 6, 7) as well as high rates of AIDS (8), both of which decrease an individual's immunity and the ability of the body to withstand these infections. Several studies have suggested that dietary intake of selected nutrients can prevent progression of Human Papilloma Virus (HPV) infections (9, 10) and Bacterial Vaginosis (11). However, some reports from China dispute the importance of poverty as a risk factor for STD (12, 3).

There has been a decrease in ulcerated STI in Jamaica since the 1950s. This is likely to be due to improvement in healthcare provision, with the introduction of antibiotics and the increased use of condoms as well as improved social conditions. Sexual responsibility has, however, not changed during this period with early initiation of coitus and multiple partners being the norm. However, a significant increase in the sale and use of condoms has been a more recent feature, associated with increased promotion of family planning in the 1970s and more so, during the HIV epidemic in the 1980s.

In a previous paper, we demonstrated that the rates of HPV related cancer of the vulva and penis are declining in Jamaica (13). We proposed that this decline was associated with declining poverty rates in Jamaica. It has previously been shown that poverty and malnutrition especially of folic acid, result in persistence of HPV (14). We think that this may also apply to other STIs and may explain the disparity seen in the occurrence of these ulcerated lesions in poor countries and in socio-economically deprived people in rich countries compared to the affluent.

# SUBJECTS AND METHODS

We examined other ulcerated STI from data collected from the Comprehensive Clinic in Jamaica and present here the cases per year. We also examined possible causes for the three peaks seen in all the graphs and compared these with events occurring in Jamaica during the same period.

# RESULTS

For all the conditions, we found a significant decline from 1958 to present and found three major peaks corresponding to the 1960s, 1970s and 1980s. The three peaks are not pronounced in all the conditions but they are present in bacterial, chlamydial and viral conditions.

In the case of syphilis, there was a peak of reported cases in 1957 of 600 cases, the second peak was in 1975 of 200 cases and the third peak in the late 1980s with a sustained decrease since then (Fig. 1). For Granuloma inguinale, far fewer cases were reported but the three peaks are still evident in the 1960s and 1970s, though less obvious, and from 1986 to 1996 (Fig. 2). For chancroid and LGV (caused by chlamydia), the three peaks are again evident although the peaks in the 1970s were not as obvious as in the other graphs



Fig. 1: Graph of cases reported per year for syphilis (1954–2003).



Fig. 2: Graph of cases reported per year for granuloma inguinale (1959–2003).



Fig. 3: Graph of cases reported per year for chancroid (1959–2003).

(Figs. 3, 4). For Herpes simplex, the lone viral condition, the three peaks are present with massive peaks in the 1970s and 1980s and 1990s falling off as in the other graphs (Fig. 5).



Fig. 4: Graph of cases reported per year for Lymphogranuloma venereum (1959–2003).



Fig. 5: Graph of cases reported per year for Herpes simplex (1959–2003).

We noted that all the STI graphs also had smaller spikes in certain years (1963, 1972, 1984 and 1990). These could be related to environmental disasters such as the Hurricane Flora floods of 1963, the all island drought of 1971 and Hurricane Gilbert of 1988, which led to shortage of vegetables (folic acid sources).

## DISCUSSION

During the period reported, the poverty graph for people living below the poverty line is similar to the graphs showing stark poverty in the late 1950s and early 60s in Jamaica with 55% of the population reportedly in this position. This improved up to the 1970s, which was a period of economic upheaval in Jamaica where there was massive food shortages and economic adjustment. Things have improved gradually as the poverty rate lessened (13).

There is strong support for the theory that there is a link between poverty, undernutrition and STD. Neggers *et al* (11) have shown an inverse relationship between severe bacterial vaginosis and folate intake while others have shown that where the prevalence of bacterial vaginosis is high, there was significant association with having a bacterial vaginal STI and trichomoniasis (15). Several other reports have linked poverty to viral STI rates especially HPV and this has not been explained by lack of healthcare or lifestyle (7, 16).

We note that the smaller spikes in certain years (1963, 1972, 1984 and 1990) have peaks and troughs which correlate almost exactly with that found by Readett *et al* (17) of megaloblastic episodes in the sickle cell patient cohort in Jamaica, during the same period. One possibility is that these were years of shortage of vegetables (drought or bad weather) with epidemics of folate deficiency as occurred after Hurricane Gilbert in 1988 (17, 18). We propose a similar relationship between poverty and undernutrition and the incidence of genital ulceration.

In the 1980s and 1990s, poverty rates were improving but this was the period of the start of the HIV epidemic and we propose that the latter might be responsible for the third peak. During this period, HIV seroprevalence in patients attending STI clinics in Jamaica increased from below 10/1000 in 1986 to a peak of 70/1000 in 1999, falling to 45 /1000 in 2005 (20).

Also important has been a massive increase in sales of condoms from 2 million in 1985 to 10 million in 1999 and which has since been sustained (19). There is no doubt that improvements in healthcare and education, with improved health-seeking behaviour, have had an impact on some of the decreased prevalence seen. As in the case of syphilis, the provision of rapid-on-site testing, training of healthcare providers, contact investigation of infectious cases and syndromic management of genital ulcers may contribute to the decline in the incidence of genital ulcers (20). Also, the herpes scare of the 1990s (21) has resulted in some of the apparent peaks in the graphs. However, the fact that the decreased prevalence is seen in both bacterial conditions which are readily treatable with antibiotics and viral conditions which are not, suggests that other factors, such as safer sex practices and environmental issues, may be important. The apparent decrease in the number of cases at the Comprehensive Clinic may also have been due to changes in reporting and data collection of STIs as well as the decentralization of STI management to include other health centres and private practitioners. However, the fact that all the graphs have a similar profile to the graphs of Readett et al (17) as well as the peak which occurred with the HIV epidemic is highly suggestive that there may be an association between the cases and environmental events.

The resurgence in the 1980s–90s of STIs associated with the HIV epidemic supports the theory that patients' immunity is an important factor in the acquisition of STIs. It is well known that patients with AIDS are less able to resist these infections and it is therefore possible that in the normal population many people who are exposed will not develop the diseases because of their normal immune system.

This information has important implications for STI prevention in poor societies. We believe that further investigations are needed to see if improved nutrition and folate supplementation as well as conventional safer sex practices will aid in a reduction of these conditions and decrease HIV and HPV rates in a cost effective way.

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