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A review of 100 years of syphilis in Austria from 1921 to 2021

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Abstract

Syphilis, a deadly sexually transmitted infection (STI), lost its terror with the introduction of antibiotics. Recent epidemiological data, however, revealed a reemergence of syphilis in Europe, despite the availability of inexpensive and effective treatments. In Austria, the epidemiological data are incomplete due to limited reporting requirements. Nevertheless, Austrian mass media reported increasing syphilis rates, as documented for other European countries. This study provides an epidemiological overview of syphilis cases in Austria from 1921–2021 and tested the hypothesis that in Austria syphilis rates increase as observed across Europe. Data on syphilis cases from 1921–2019 in Austria were gathered from statistical yearbooks and reports. Additional sex-specific data for 1998–2021 was provided by the Vienna Health Service. Syphilis incidences were highest in the 1920s and declined steadily until 1993. Since then, cases have increased slightly, peaking in 2009 and 2018 at seven cases per 100,000 residents, the highest incidence syphilis rate since 1975. This increase is comparable to that seen in other European countries, consequently this hypothesis was verified. Men living in Vienna were nine times more likely to be infected with syphilis than women of comparable age. The rising syphilis infection rates in Vienna over the last 30 years correspond to those in other Austrian provinces, but also to those in other European countries. From the viewpoint of public health, the introduction of an obligatory reporting system of all diagnosed syphilis cases in Austria is recommended. In addition, regular screenings, treatment, and efforts to reduce discrimination and stigma against sexual minorities may help to prevent rising syphilis rates.

Take-home message for students Recent epidemiological reports have shown a sharp increase in syphilis cases across Europe, with men who have sex with men (MSM) at the highest risk. Regular syphilis screenings, consistent condom use, and proper education are effective countermeasures. Combating stigma and discrimination against sexual minorities is also essential to reverse the upward trend in high-risk groups.

Introduction

For centuries, syphilis was one of the most feared sexually transmitted diseases (Ho and Lukehart 2011) but syphilis represents even today an important Public Health issue. From an evolutionary point of view, the origin of syphilis was long considered to be located in South and Central America, from where it reached Europe with Christoph Columbus at the end of the 15th century and triggered a devastating epidemic. However, recent archaeogenetic analyses show a somewhat more diverse picture and raise new questions about the origin of this disease (Majander et al. 2024). In early modern times Europe, syphilis became a deadly epidemic that doctors had nothing to counter. The heterogeneous symptoms of syphilis made it difficult to diagnose the infection at an early stage. Furthermore, the etiology of syphilis and successful treatment methods remained unknown until the 20th century (Barnett 2018). Even historically well-known people such as Franz Schubert, Vincent van Gogh, but also members of the Austrian imperial family suffered from syphilis. Shakespeare himself gave the infection the name "the endless disease" (Sadoghi et al. 2023).

It was not until 1905 that the dermatologist Erich Hoffmann and the zoologist Fritz Schaudinn succeeded in identifying the bacterium *Trepanoma pallidum* from the spirochete family as the causative agent of syphilis. The first promising syphilis drug, Salvarsan (arsphenamine), was introduced in 1909. Despite these advances in the treatment of syphilis, it was not until the discovery of the antibiotic effect of penicillin in the 1940s that effective syphilis treatment became possible, thus taking the fear out of the disease (Barnett 2018; Schöfer et al. 2020). Syphilis rates decreased in Europe. Consequently, in Austria, syphilis was only listed as a limited notifiable disease in 1945 (RIS 2024). This implied that a syphilis infection only had to be reported by the physician or the hospital if the infected person refused treatment or if it could be assumed that the infected person's behavior could lead to further spread of the infection (Sadoghi et al. 2023). The data available on the prevalence of syphilis in Austria remaintherefore severely limited.

In the 1980s, the fear of HIV infections and AIDS affected sexual behavior, and 'safer sex' gain in importance. As a result, infection rates of sexually transmitted diseases decreased generally in Europe (Schöfer 2004). Since the turn of the millennium, however, the incidence of syphilis has been rising again, despite effective treatments in high-income countries (Schöfer 2004; Leung-Chen 2008; Ho and Lukehart 2011). Syphilis is therefore classified as a re-emerging infectious disease and is becoming a significant public health problem again (Eppes et al. 2022; Peeling et al. 2017; WHO 2024a; ECDC 2020; ECDC 2024).

This re-emergence of syphilis is a dramatic and unnecessary development, as rising syphilis rates could easily be prevented. In addition, it might even be possible to eliminate the pathogen. On the one hand, the transmission routes are well known, so the infection usually occurs via vaginal, anal, or oral sex, or, in the rare case of congenital syphilis, is transmitted from the mother to the fetus during pregnancy (D'Hemecourt et al. 2024). Furthermore, humans are the only hosts, and serological diagnoses are inexpensive and widely available. The rather long incubation period offers the possibility to prevent further transmission through rapid treatment. There are also no reports of antibiotic resistance to date (Rompalo 2001; Schöfer et al. 2020; ECDC 2020; ECDC 2024). Consequently, a new prevention concept for syphilis appears necessary as recently many people infected with syphilis are symptom free or are unaware of them (WHO 2024b; AGES 2024).

However, even in the primary stage, the risk of also becoming infected with HIV is increased by a factor of two to five. If the infection remains untreated, the disease progresses to the secondary and finally to the tertiary stage and then ends fatally. Sexual transmission usually occurs in the early stages, i.e., up to two years after infection (Schöfer 2004; WHO 2024a).

The Annual Report of the European Center of Disease Prevention and Control (ECDC) from 2022 reports 35,391 documented cases of syphilis in 29 EU/EEA member states (ECDC 2024). This means a reporting rate of 8.5 cases per 100,000 residents for those countries that have a reporting system. This corresponds to an increase in the reporting rate of 34% compared to 2021 and an increase of 41% compared to 2018, with the highest rates recorded in Malta (24.4 cases per 100,000 residents). The lowest rates of less than three per 100,000 residents were recorded in Croatia, Estonia, Latvia, Romania, and Slovenia. Furthermore, a marked sex difference was documented: Reported syphilis cases were eight times higher among men than among women and highest among 25 to 34 year olds (40 cases per 100,000 population) (ECDC 2020; ECDC 2024). In this ECDC report D, no data are available for Austria. This is due on the one hand to the fact that syphilis – as mentioned above – is only a conditionally notifiable disease in Austria, and on the other hand to the federal structure of the healthcare system in Austria. Each federal state has its own strategy for collecting and managing epidemiological data.

Interestingly, despite the lack of a central syphilis register in Austria, Austrian mass media reported dramatic increases in syphilis rates during the last years (Swaaf 2017; Greß 2019; Paya 2022). This raises the question of the sources of this media assessment in the absence of official data. The aim of the present study was therefore initially to search for valid sources on syphilis prevalence in Austria and thus to critically examine the information provided by the mass media. In a second step, the following hypothesis was to be tested: The prevalence of syphilis has increased in Austria to a similar extent as in the other EU/EEA states.

Material and Methods

Data sets

Our inquiry to Statistics Austria finally led to us receiving a reference to the Statistical Handbook for the Republic of Austria, which, although not available online, could be consulted in the National Library. The data sources contained the numbers of people with diagnosed syphilis reported by hospitals and practitioners. Unfortunately, the diagnostic methods applied were not documented. Data sources for the individual time periods mentioned in this study are presented in Table 1.

To provide comparable data for all time periods, the incidence rates, i.e., syphilis cases per 100,000 residents, were calculated for each year. The corresponding annual average population was taken from the Demographisches Jahrbuch 2019 (Mikulasek et al. 2020). The results were rounded to the first decimal place. Changes in incidence rate (IR) of syphilis over time have been calculated as follows:

Change of IR =

(IR at the end of the period – IR at the start of the period) *100/IR at the start of period

Data concerning syphilis cases in Austria were available for the following time periods:

Table 1 Data sources about prevalence of syphilis in Austria according to time period

period	region	source
1921 – 1936	Austria	Statistisches Handbuch der Republik Österreich (1923–936)
1948 – 1989	Austria	Statistisches Handbuch der Republik Österreich (1948–1989)
1990 – 2015	Austria	Statistisches Jahrbuch der Republik Österreich (1990–2000) Statistisches Jahrbuch Österreichs (2001–2018)
2018 – 2019	Austria	Jahrbuch der Gesundheitsstatistik (2018–2019)
1998 – 2021	Vienna	Health Service of the City of Vienna (1998–2021)

*References of all statistical yearbooks were summarized here, but separately listed in the reference list

Syphilis cases from 1921–1936 and 1948–1989

It should be noted here that the total syphilis cases for Austria for the years 1986 and 1987 did not match in the data broken down by those discharged and those who died and in the data by the provinces. The data were extracted from the same series but from different years (Österreichisches Statistisches Zentralamt 1987; 1988; 1989).

Syphilis cases from 1990–2015.

For the years 2008, 2009, and 2010, information was obtained from both the Statistik Austria(Statistik Austria 2010; 2011; 2012) as well as from the corresponding annual reports. However, the case numbers differed only minimally.

Syphilis cases in 2018 and 2019.

The information on syphilis cases for 2018 and 2019 was taken from the *Jahrbuch der Gesundheitsstatistik* (Prammer-Waldhör et al. 2020; Prammer-Waldhör et al. 2021).

Syphilis cases in Vienna from 1998–2021.

Syphilis cases in Vienna according to sex for the years 1998–2021 were provided by the Health Service of the City of Vienna (Gesundheitsdienst der Stadt Wien n.d.). To calculate corresponding incidence rates per 100,000 residents, data on the population in Vienna was taken from Viennese Health Service (Stadt Wien 2023). The values represent the population status on 31 December of the respective year.

The data were also categorized according to historical medical events. To consider the population growth, incidence rates per 100,000 residents were used. The following periods were considered.

Syphilis cases from 1921–1936.

This period represented the syphilis situation in Austria before the use of penicillin from 1945 onwards (Barnett 2018).

Syphilis cases from 1948–1985.

This period represented the syphilis situation in Austria when penicillin was already available and used to treat syphilis (Ho and Lukehart 2011). The parameter sex was available for these years. A distinction was therefore made into: *Sex differences in syphilis cases 1948–1985*. To determine sex differences, absolute numbers were analyzed.

Syphilis cases from 1986–2000.

This period represents the syphilis situation in Austria when HIV and its final stage AIDS were not yet treatable and ‘safer sex’

was strongly recommended (Schöfer 2004; ECDC 2020; ECDC 2024).

Syphilis cases from 2001–2019.

This period represents the syphilis situation in Austria, in which HIV and its final stage, AIDS are treatable, and no further restrictive sexual behavior can be assumed (Rasokat 2021; Spinner et al. 2016). This analysis should also provide an overview of the current syphilis cases in Austria.

Syphilis cases in Vienna from 1998–2021.

This period represents the current syphilis situation in Vienna. The parameter sex was available for these years. Sex differences in syphilis cases were determined in Vienna 1998–2021. Absolute numbers were used for analysis.

Statistical analysis

Statistical analysis was performed using IBM SPSS version 29. Kolmogorov-Smirnov tests (KS-tests) were performed to obtain information regarding the distribution of the data set. According to the results of the KS-test parametric or non-parametric tests were applied. Consequently, for the period from 1948–1985, sex differences in syphilis rates were tested with respect to their statistical significance using the Mann-Whitney U-test. For the period from 1998–2021 in Vienna, sex differences were tested using the student's t-test. A $p<0.05$ was considered statistically significant.

Results

Syphilis incidence between 1921 and 2019

Table 2 shows the incidence rates of syphilis at the start and at the end of the chronological periods. The highest incidence rates occurred in 1921 and 1948, the lowest incidence rates in 1993. Furthermore, the change in incidence rates from the beginning to the end of the respective time periods as well as the years with the highest and lowest incidence rates are presented. The incidence rates of syphilis cases per 100,000 residents declined markedly in Austria during the first three time periods. However, from the year 2001 to 2019, the incidence rates increased again.

Figure 1 shows the number of reported syphilis cases per 100,000 residents in Austria between 1921 and 2019. For the years 1937 to 1947 no data are available. Therefore, these years are not included in the graph. The syphilis incidence declined markedly after the introduction of penicillin in the late 1940s and increased very slightly in the 1960s. After a further decline in the 1980s, a slight increase from 2000 onwards is observable.

Sex differences in syphilis cases from 1948–1985.

Sex-specific data concerning syphilis cases were available for Austria between 1948 and 1985. Figure 2 clearly shows that far more women infected with syphilis than men were registered in 1948 and 1949. From 1952 onwards, however, no significant sex differences in syphilis infections can be observed. Therefore, during this chronological period, no significant differences in the numbers of absolute syphilis cases occurred between men and women ($U=700.5$, $p=0.823$) (Table 3).

Unfortunately, for the chronological period 1998 to 2021, data concerning sex-specific syphilis rates were only available for Vienna. In Vienna, men and women differed significantly ($t = 7.2$, $p = <0.001$) in the absolute numbers of syphilis cases during this chronological period (Table 3).

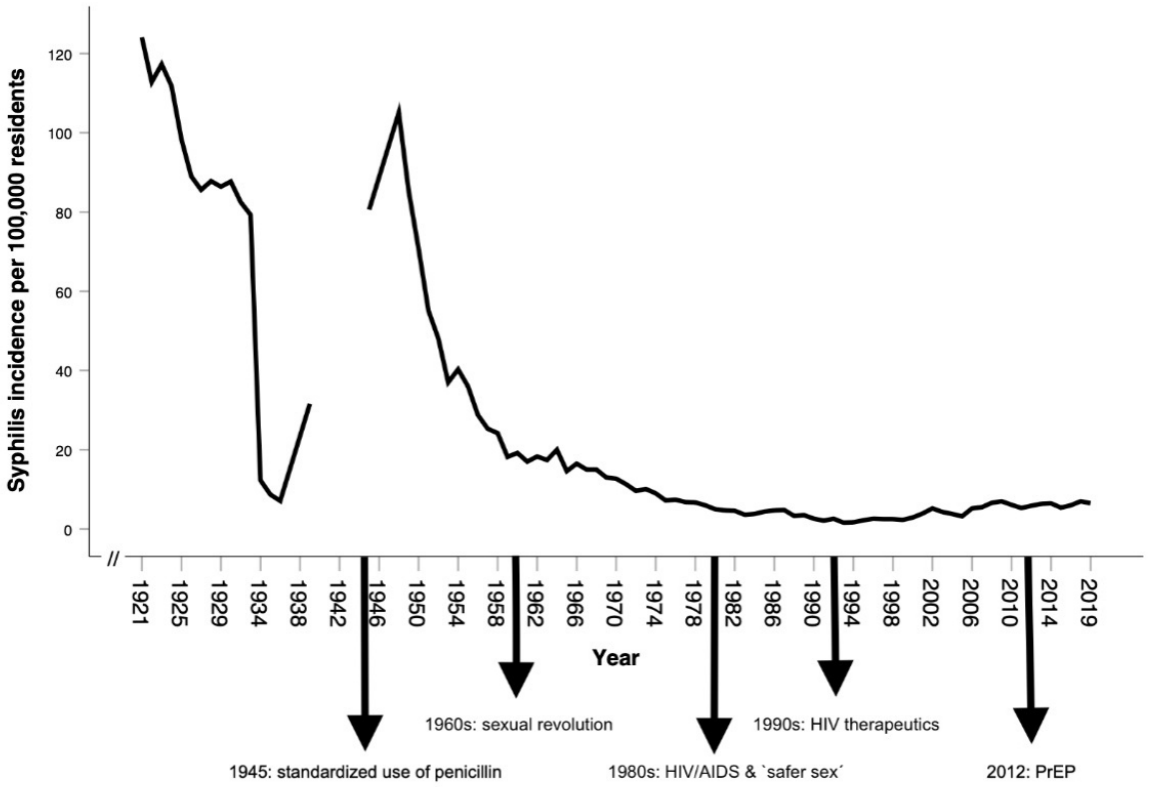

Figure 1 Reported syphilis cases in Austria per 100,000 residents for the years 1921–2019 without the years 1937–1947

The marked sex differences in absolute syphilis cases in Vienna between 1998 and 2021 are also presented in Figure 3. Especially from the year 2004 onwards, significantly more men than women were registered as infected with syphilis.

Looking at the data including both sexes, the year with the highest number of syphilis cases per 100,000 residents in Vienna was 2018 with an incidence rate of 27. The lowest number of syphilis cases per 100,000 residents was found in 1999, with an incidence rate of 8.4. On average, there were 18.2 [SD=4.8) syphilis cases per 100,000 residents per year in these 24 years. The data showed an increase of 76% in incidence rates from 1998 to 2021 (Figure 4).

Table 2 Descriptive statistics of incidence rates of syphilis cases per 100,000 residents and the change of incidence rate (IR) in Austria according to the four chronological periods.

Chronological period	IR at the start and at the end of period		Change of IR (%)	Years with the highest IR		Years with the lowest IR		Central tendency and dispersion	
	IR start	IR end		Year	IR	Year	IR	M	Half IQR
1921–1936	124.1	7.1	-94.3%	1921	124.1	1936	7.1	87.7	16.3
1948–1985	105.1	4.4	-95.8%	1948	105.1	1983	3.6	15	9.5
1986–2000	4.8	2.9	-38.3%	1986	4.8	1993	1.6	2.6	0.6
2001–2019	3.9	6.5	+66.7%	2009 + 2018	7.0	2005	3.2	5.7	1.0

Legend: IR = Incidence rate; M= Median, Half IQR = Interquartile range

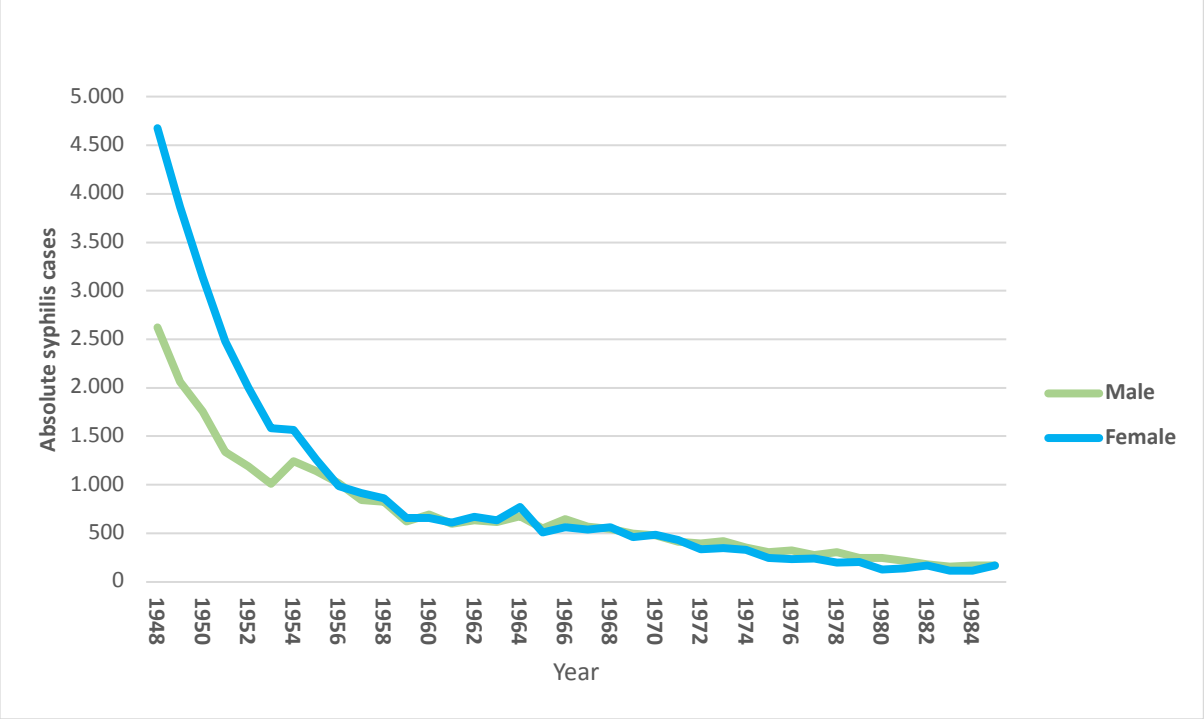

Figure 2 Absolut syphilis cases for each sex separately in Austria between 1948 to 1985.

Discussion

Although there has been no general obligation to report syphilis infections in Austria since 1945, we were able to identify some valid sources of syphilis infections. Information concerning registered syphilis cases were found in the so called *Statistische Handbücher für die Republik Österreich* (Bundesamt für Statistik 1923; 1924; 1925; 1926; 1927; 1928; 1929; 1930; 1931; 1932; 1935; 1936; 1937) as well as in the *Statistischen Jahrbücher für die Republik Österreich* (Österreichisches Statistisches Landesamt 1938; 1950; 1951; 1952; 1953; 1954; 1955; 1956; 1957; 1958b; 1958a; 1959; 1960; 1961; 1962; 1963; 1964; 1965; 1966; 1967; 1968; 1969; 1970; 1971; 1972; 1973; 1974; 1975; 1976; 1977; 1978; 1979; 1980; 1981; 1982; 1983; 1984; 1985; 1986; 1987; 1988; 1989; 1990; 1991; 1992; 1993; 1994; 1995; 1996; 1997; 1998; 1999; Statistik Austria 2001) (2002; 2003; 2004; 2005; 2006; 2007; 2008; 2009; 2010; 2011; 2012; 2013; 2014; 2015; 2016; 2017; 2018) and in *Jahrbuch der Gesundheitsstatistik* (Prammer-Waldhör et al. 2020; Prammer-Waldhör et al. 2021). The main hindrance was that these

Table 1 Table 3 Sex differences in absolute syphilis cases in Austria between 1948 and 2001.

Period	Region	Men						Women						Sig.
		Year with highest n		Year with lowest n		M Half IQR)		Year with highest n		Year with lowest n		M Half IQR)		p-value
		Year	n	Year	n	M	IQR	Year	n	Year	n	M	IQR	
1948–1985	Austria	1948	2625	1983	155	560	288	1948	4679	1983	115	549	346	0.823
		Year	n	Year	n	mean	SD	Year	n	Year	n	mean	SD	p-value
1998–2021	Vienna	2018	455	1999	67	283	99.2	2009	130	2020	46	83.3	25.0	0.001

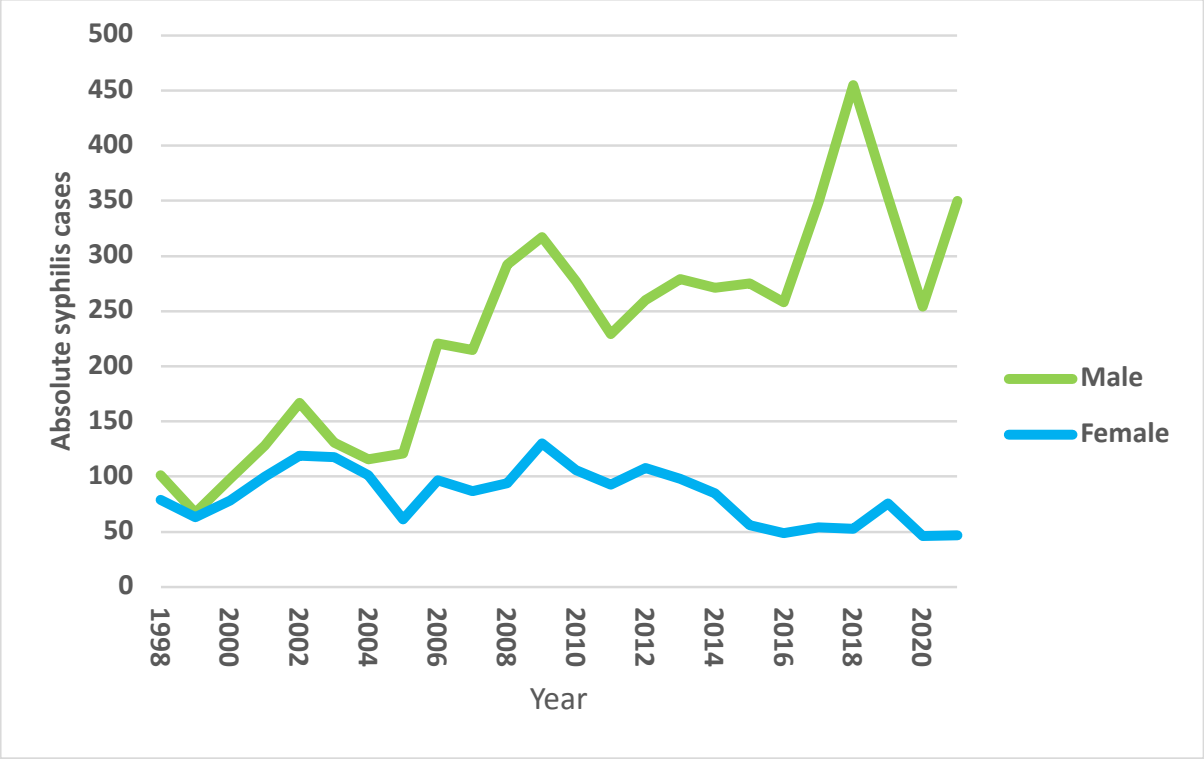

Figure 3 Absolute number of syphilis cases in Vienna for each sex separately for the years 1998–2021.

sources, which provided information concerning syphilis infections in Austria, were not digitized. Nevertheless, the objectives of the study could be fulfilled.

Furthermore, our hypothesis that syphilis rates increased over the last 20 years, as in other European countries, was verified. We were able to show trends in the syphilis rate in Austria between 1921 and 2021 and could confirm observations from other European countries, which indicated an increase in syphilis infections during the last 20 years (Leung-Chen 2008; Ho and Lukehart 2011; Eppes et al. 2022; Peeling et al. 2017).

As expected, for Austria, the highest rates of syphilis were found in the 1920s and 1930s. As antibiotics did not yet exist, there was no effective treatment for this sexually transmitted disease available (Barnett 2018), and consequently, the syphilis rate was extremely high. After 1948, and especially since the introduction of penicillin in the therapy of syphilis, the incidence of syphilis in Austria fell significantly. Between 1948 and 1985, there were on average 72.7 fewer cases per 100,000 residents than in the previous period. The incidence rates fell by a total of 95.8%. This may be due to the more effective therapy, but also to the decision to downgrade syphilis in Austria to a conditionally notifiable disease. As a result, not all syphilis cases were recorded centrally from 1945 onwards.

From 1953 onwards, the reported syphilis incidence in Austria decreased rapidly. On the one hand, the treatment of syphilis infections improved, while on the other hand, during the 1950s both sexes and especially people that prefer same-sex sexual relationships were still socially restricted and possibly not very sexually active. Furthermore, the lack of effective contraceptives had a profound influence on sexual behavior. This may have led to low numbers of syphilis cases among both men and women. During the 1960s, however, a slight increase in syphilis rates occurred. This small increase could be linked to the social changes in the course of the sexual

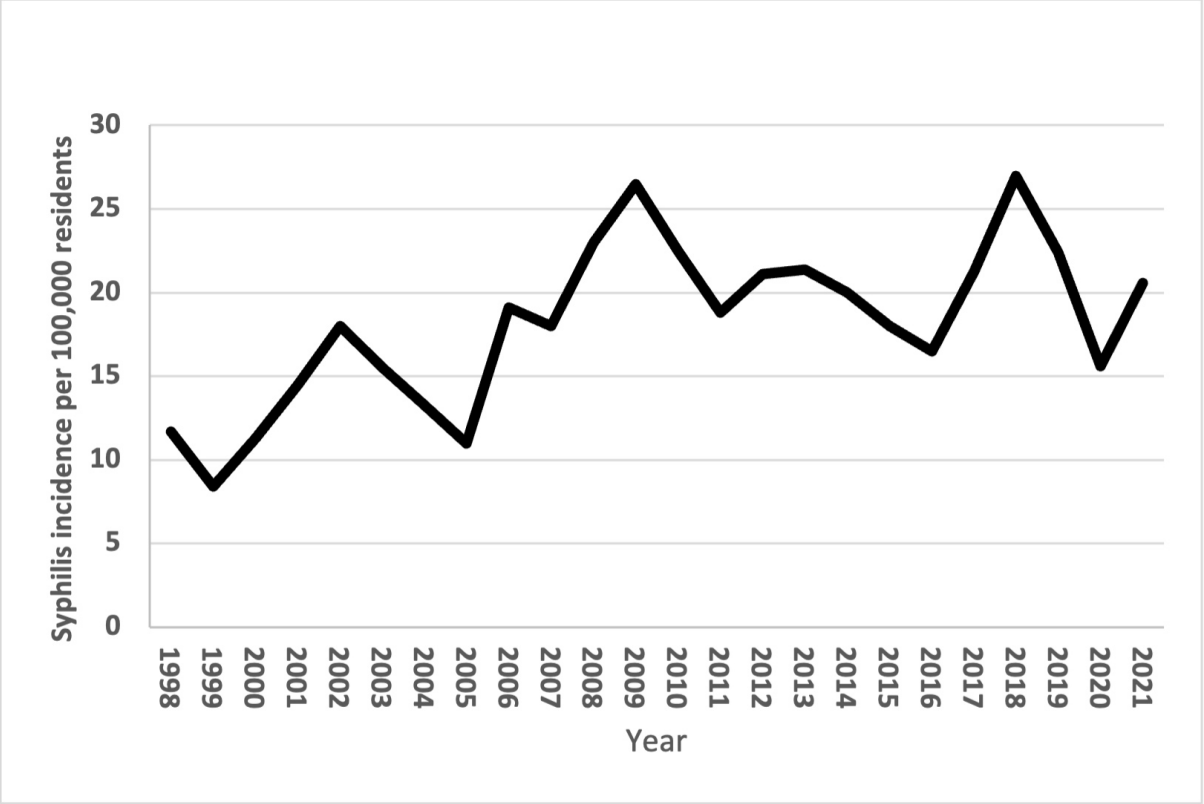

Figure 4 Reported syphilis cases in Vienna per 100,000 residents for the years 1998–2021.

revolution in the 1960s (Wouters 1998; Allyn 2016). Paradoxically, the widespread availability of penicillin as an effective treatment for syphilis is seen as one of the causes of the change in sexual behaviour and ultimately the sexual revolution (Francis 2013). Furthermore, the introduction of hormonal contraceptives such as 'the pill' had a major impact on changes in sexual behavior during the 1960s (Bailey 1997).

In the 1980s and 1990s the syphilis infections decreased markedly. This trend may be linked to the emergence of HIV and AIDS in the 1980s. In 1981, mainly young homosexual men in the US suddenly fell ill and died from infections that their immune systems should have been able to fight without any problems. The first cases of the 'new immunodeficiency disease' were diagnosed, and the fear of a 'gay plague' spread rapidly. One year later, the disease had arrived in Europe, and in 1983 HIV infections affected increasingly heterosexual people as well (Greene 2007). The global fear of this deadly infection triggered the use of condoms, which protected men and women not only from HIV infections but also from so called classical sexually transmitted diseases such as syphilis (Chow et al. 2019). The decreasing syphilis rates might be a byproduct of the widely used 'safer sex' (ECDC 2020; ECDC 2024).

We might interpret the decreasing syphilis rates with the emergence of HIV and fatal AIDS diseases. Both influenced sexual behavior and thus also had an impact on syphilis infections. During the period when HIV infection and its final stage AIDS were not treatable and ended deadly, the fewest syphilis cases were found in Austria of all analyzed periods. There was an average of 12.6 fewer cases per 100,000 residents in Austria compared to the period from 1948–1985. The rates fell by a total of 38.3%. From 1994 onwards, however, there was a slight increase in incidence rates. While 1993 was the year with the fewest syphilis

cases per 100,000 residents (1.6 cases), the incidence rate in 2000 was already at 2.9. This means that the number of cases per 100,000 residents increased by 81.3% within seven years. One reason for this could be the emergence of drug treatment for HIV and AIDS in the 1990s. In 1995, the HIV protease inhibitor was approved, and because of the drug HAART (Highly Active Antiretroviral Therapy), the death rate due to HIV and AIDS began to decline sharply in 1997 (Greene 2007). This could have reduced the fear of HIV and AIDS, and might have resulted in less condom use and in increased sexual risk behavior (Chow et al. 2019). However, Cassell et al. (2006) reported that the use of condoms rose significantly in the UK between 1990 and 2000, especially among young people (16–24 years old). They also reported, however, that at this time, multiple or frequent partner changes and high-risk sex among men who have sex with men (MSM) increased.

Our study showed that in Austria the incidence of syphilis increased as HIV and its final stage AIDS became treatable. After the year 2000, there were almost twice as many people infected with syphilis per 100,000 inhabitants compared to the period from 1986–2000, and the incidence rates increased by a total of 66.7% during this period. The years 2009 and 2018 marked the peak of syphilis cases with an incidence rate of 7. This result coincided with the Annual Epidemiological Report for 2018 on syphilis cases (ECDC 2020). For the year 2018, they also recorded an incidence rate of 7 for Europe. Consequently, our hypothesis, that the increase in syphilis incidence in Austria was comparable to that described for other European countries by the European Center for Disease Prevention and Control, can be considered verified.

Rasokat (2021) explained this increase by access to modern HIV therapeutics. These are very effective, well tolerated, and enable those affected to live unrestrictedly. In addition, in 2012 the drug Pre-Exposure Prophylaxis (PrEP) to prevent HIV NIAID came onto the market (NIH 2024), which protects people who take it against an infection with HIV. Consequently, people increasingly lost their fear of HIV and AIDS. Jansen et al. (2020) also discussed the potential increase in sexual risk behavior resulting from the safety of PrEP. They were able to show that the prevalence of sexual transmitted infections (STI) was significantly higher in MSM who took PrEP than in MSM who did not use the drug. This is because this drug does not protect against other STIs, leading to a widening gap between HIV and syphilis cases and a general increase in STIs (Rasokat 2021).

Furthermore, a significant sex difference in the absolute number of syphilis cases occurred in Vienna. On average, there were 149.4 more syphilis cases per year among men. From 2013 onwards in particular, syphilis cases among men increased rapidly in absolute terms and peaked in 2018, when 8.6 times as many men were infected as women. The European Centre for Disease Prevention and Control (ECDC 2020; ECDC 2024) recorded a ratio of 9:1 syphilis cases for men and women for that year. This number is comparable with the result of this study. In Europe, 69% of syphilis cases were reported by MSM in 2018 (ECDC 2020; ECDC 2024). It was not possible to show whether MSM in Vienna were also primarily responsible for this significant sex difference in syphilis cases because the parameter 'sexual orientation' was not collected for this data. Sexual orientation has a major impact on STI infection rates.

Studies have shown that estimates of the prevalence of syphilis cases are particularly high in samples that include exclusively male sex workers, transgender women, and transgender sex workers. Worldwide,

an extreme increase in syphilis cases in MSM has been observed from 2000 until 2020. In regions, where same-sex acts are criminalized, a low syphilis prevalence is reported.

Consequently, there are fewer sexual acts between men and thus also a reduced risk of infection with syphilis. On the other hand, this could lead to the situation that sexually active MSM, who are at high risk of contracting syphilis, do not participate in prevalence studies and/or treatments (Tsuboi et al. 2021).

Another relevant factor in favor of an increased prevalence of syphilis cases among MSM in high-income countries is the possibility of using the drug PrEP. With the introduction of the drug, which protects against potential infection with HIV, it appears that the protection provided by condoms is no longer considered necessary. This means that MSM are currently experiencing a liberation from the obligation to use condoms and thus a kind of sexual revolution, which can lead to the transmission of other STIs (Rasokat 2021). Furthermore, the willingness to have sex without a condom increased, especially among MSM (Spinner et al. 2016).

Within Austria, Vienna represents a special situation. The latest data on syphilis cases in Vienna showed an increase of 76% in incidence rates from 1998-2021. What stands out is that the mean value for syphilis incidence rates in Vienna was 18.2 (SD=4.8) cases per 100,000 residents. With an incidence rate of 27 cases per 100,000 residents, 2018 marked the year with the highest number of syphilis cases for this period in Vienna. This incidence rate was clearly higher than that recorded for Austria in 2018. Consequently, it might be assumed that the capital city was responsible for the high rates of syphilis cases in 2018 in Austria. This is not surprising because the city of Vienna is the most densely populated region in Austria (Statistika 2024). Urban centers often show the highest numbers of infection (Nunn et al. 2015).

From the viewpoint of Public Health, the rising rates of syphilis make new strategies necessary. Risk groups should be identified and close monitoring should be enforced. Special risk groups such as MSM, MSM who have been diagnosed with HIV, transgender women, and sex workers, who represent vulnerable and stigmatized groups within society (Fenton et al. 2008; Kojima and Klausner 2018), should be encouraged to participate in routine screenings to detect early latent syphilis stages before they progress to the secondary stage (Chow et al. 2018). Unfortunately, stigmatized groups prefer to remain anonymous due to the fear of discrimination when it comes to testing for STIs. A lack of confidentiality can be an obstacle to having tests carried out in a clinic (Kularadhan et al. 2022). In general, people who perceive STIs as stigmatizing are less likely to be tested (Cunningham et al. 2009). Stigmatization is also still a problem in health care systems. According to a German study, even medical students perceived people who were infected with STIs as more stupid and less responsible than people who had no STI infection (Klein et al. 2021). This stigmatization observed in the healthcare might result in avoiding testing for STIs or seeking medical treatment (Klein et al. 2021). Especially for people that prefer same-sex sexual relations and who are already stigmatized because of their sexuality (Fenton et al. 2008), this represents an additional burden.

Another problem represents the increasing use of PrEP (Hoff et al. 2015). In Austria the costs for PrEP are covered by social insurance since April 2024 (Bundesministerium Arbeit, Soziales, Gesundheit, Pflege und Konsumentenschutz 2024). Jansen et al. (2020) recommended syphilis tests for PrEP users and MSM with changing partners every three to six months. In ad-

dition, PrEP users should be informed that this medication only protects against HIV infection, but not against other STIs (Rasokat 2021; Tripathy et al. 2022). Consequently, the consistent use of condoms must still be promoted. Cassell et al. (2006) were able to show that inconsistent condom use occurs particularly among people with multiple sexual partners. Studies from 2010 and 2015 showed that around 30% of the participating MSM decide to have sex without condoms due to taking PrEP. With the availability of the drug, a reduction in the use of condoms occurred (Golub et al. 2010; Hoff et al. 2015).

Limitations of the study

The main limitation of this study is the fact that there has only been a limited obligation to report syphilis cases in Austria since 1945 (RIS 2024; Sadoghi et al. 2023). Therefore, the information on syphilis cases is incomplete and it can be assumed that the number of unreported cases is significantly higher than the number of cases that are recorded. The last year for which information on syphilis rates in Austria was provided is the year 2019 (Prammer-Waldhör et al. 2021). Furthermore, information on sex, age, or stage of syphilis is missing. It is therefore difficult to make concrete statements about the number of people infected with syphilis in Austria.

Conclusion

Increasing syphilis rates could be verified for Austria in general and for Vienna in particular. The main problem is that syphilis has been subject to a limited reporting obligation for 78 years (RIS 2024). This means that in almost 80 years, little has changed in the fight against syphilis (Hook and Peeling 2004). The Austrian government has not yet developed any strategies to control this public health problem, although regular syphilis screening and treatment, if combined with other prevention measures, such as consistent condom use and proper education, are particularly effective (Tsuboi et al. 2021). To improve the situation, a strict syphilis recording system has to be implemented in Austria. Innovative and evidence-based steps are needed to reverse the trend of increasing syphilis cases in risk groups, such as MSM (Abara et al. 2016), including a strict approach against discrimination and stigmatization of sexual minorities (Fenton et al. 2008; Klein et al. 2021). It is really time to develop new strategies.

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