

# Serial surveys of Hong Kong medical students regarding attitudes towards HIV/AIDS from 2007 to 2017

Greta Tam, NS Wong, SS Lee \*

## ABSTRACT

**Introduction:** With widespread adoption of antiretroviral therapy, human immunodeficiency virus (HIV) epidemiology has changed since the late 2000s. Accordingly, attitudes towards the disease may also have changed. Because medical students are future physicians, their attitudes have important implications in access to care among patients with HIV/acquired immunodeficiency syndrome (AIDS). Here, we performed a survey to compare medical students' attitudes towards HIV/AIDS between the late 2000s (2007-2010) and middle 2010s (2014-2017).

**Methods:** From 2007 to 2010, we surveyed three cohorts of medical students at the end of clinical training to assess their attitudes towards HIV/AIDS. From 2014 to 2017, we surveyed three additional cohorts of medical students at the end of clinical training to compare changes in attitudes towards HIV/AIDS between the late 2000s and middle 2010s. Each set of three cohorts was grouped together to maximise sample size; comparisons were performed between the 2007-2010 and 2014-2017 cohorts.

**Results:** From 2007 to 2010, 546 medical students were surveyed; from 2014 to 2017, 504 students were

surveyed. Compared with students in the late 2000s, significantly fewer students in the mid-2010s initially encountered patients with HIV during attachment to an HIV clinic or preferred to avoid work in a field involving HIV/AIDS; significantly more students planned to specialise in HIV medicine. Student willingness to provide HIV care remained similar over time: approximately 78% of students were willing to provide care in each grouped cohort.

**Conclusion:** Although medical students had more positive attitudes towards HIV/AIDS, their willingness to provide HIV care did not change between the late 2000s and middle 2010s.

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### New knowledge added by this study

- Although medical students had more positive attitudes towards human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), their willingness to provide HIV care in Hong Kong did not change between the late 2000s and middle 2010s.

### Implications for clinical practice or policy

- Interventions to reduce stigmatising attitudes towards people living with HIV should be incorporated during training for healthcare professionals.
- The medical school curriculum could be updated to incorporate interventions that involve experiential and affective teaching components to adequately address HIV stigma; additional clinical attachments can ensure that medical students have adequate exposure to patients with HIV.

## Introduction

Since the beginning of the human immunodeficiency virus (HIV) epidemic, stigma and discrimination have affected the provision of healthcare to patients with HIV. These factors have limited access to HIV testing and treatment; they have also prevented the uptake of interventions, such as pre-exposure prophylaxis.<sup>1</sup> The global shift necessary in the biomedical response to acquired immunodeficiency syndrome (AIDS) thus heavily relies on reductions

of both stigma and discrimination. The importance of stigma reduction has been recognised as a key priority in the Blueprint for Achieving an AIDS-Free Generation (established by The United States President's Emergency Plan for AIDS Relief)<sup>2</sup> and in the HIV investment framework (established by The Joint United Nations Programme on HIV/AIDS).<sup>3</sup>

For many years, stigma from healthcare professionals has remained a major barrier to access for HIV prevention and treatment services.

## 2007年至2017年香港醫學生對愛滋病毒 / 愛滋病態度的系列調查

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**引言：**隨着抗逆轉錄病毒療法的廣泛應用，人類免疫缺陷病毒（HIV）的流行病學自2000年代末出現變化。因此，社會對這種疾病的態度也可能有所改變。作為未來醫生的醫學生，他們的態度對HIV感染者和愛滋病患者（AIDS）在接受醫療服務上具有重要影響。有見及此，本研究以調查方式比較2000年代末（2007-2010）和2010年代中期（2014-2017）之間醫學生對HIV/AIDS的態度。

**方法：**2007年至2010年期間在臨床培訓結束時對三組醫學生進行調查，評估他們對HIV/AIDS的態度。2014年至2017年期間也在臨床培訓結束時對另外三組醫學生進行相同調查，比較2000年代末和2010年代中期他們有關HIV/AIDS的態度。每組三個隊列經過整合藉以增加樣本數值量，然後以2007-2010年及2014-2017年的隊列間進行比較。

**結果：**2007年至2010年期間調查546名醫學生，2014年至2017年期間對另外504名醫學生進行調查。與2000年代末相比，2010年代中期的醫學生在HIV診所實習期間首次遇到HIV患者，或不願意在涉及HIV/AIDS領域工作的學生明顯減少。不過，計劃專攻HIV醫學的醫學生卻有所增加。兩組隊列醫學生願意提供HIV治療服務的比例分別不大，約78%。

**結論：**雖然現時香港醫學生對HIV/AIDS的態度較為正面，但他們願意提供HIV治療服務的比例，在2000年代末和2010年代中的調查中並沒有發現顯著分別。

According to aggregated data from the Stigma Index for 50 countries, healthcare has been denied to one in eight people living with HIV (PLHIV).<sup>4</sup> Despite high antiretroviral therapy coverage, Hong Kong is no exception to this phenomenon. In the early and middle 2010s, 26.8% of PLHIV reported stigmatising experiences during treatment for non-HIV-related healthcare needs.<sup>5</sup> Since the late 2000s, advances in HIV treatment have led to a decline in mortality.<sup>6</sup> Increasing life expectancy among PLHIV has resulted in higher HIV prevalence.<sup>7</sup> Thus, medical students have an increased likelihood of encountering patients with HIV in future clinical practice, irrespective of their specialties. Because HIV epidemiology has changed over the years, medical students' attitudes towards the disease may also have changed. If attitudes have changed, the medical school curriculum should be adjusted to match such changes; this will ensure that future physicians can provide the best possible care. To our knowledge, no study has compared changes over time in medical students' attitudes towards HIV. Thus, we performed a survey to compare medical students' attitudes towards HIV/AIDS between the late 2000s (2007-2010) and middle 2010s (2014-2017).

## Methods

### Study design

This study was a descriptive cross-sectional survey to measure medical students' attitudes towards HIV/AIDS, as well as their experiences within the HIV curriculum.

### Sampling

An assessment survey was administered to final-year medical students at the Chinese University of Hong Kong, one of the two medical schools in Hong Kong. Questionnaires were distributed to medical students at the end of their final-year attachment to an HIV specialist clinic. At the Chinese University of Hong Kong, HIV education is an integral part of the medical student curriculum. Over the course of 3 years, students attend microbiology and medicine lectures regarding HIV/AIDS, a community medicine module that includes the prevention and control of HIV infection, a half-day attachment to Hong Kong's largest HIV specialist clinic, and hospital ward rounds that involve patients with HIV. The HIV curriculum was generally consistent between the late 2000s and middle 2010s. This study was based on the analysis of survey data collected from six cohorts of medical students: three from 2007 to 2010 and three from 2014 to 2017. All students were asked to complete the survey during their final teaching session. Hard copies of the self-administered structured questionnaire were distributed to the students and collected by the course instructors. All responses were anonymous and participation was voluntary.

### Data collection instrument

The study questionnaire was originally developed as an assessment form by the HIV medicine teaching team at the Chinese University of Hong Kong; it was designed for completion by final-year medical students. The form was piloted in 2005 and became standardised in 2007, with minor modifications in subsequent years.<sup>8</sup> The questionnaire was in English and consisted of 25 close-ended questions; all questions were completed by the students without assistance. The questionnaire contents slightly differed between the 2007-2010 and 2014-2017 survey periods. Seven questions that appeared in both questionnaires were selected for analysis. These questions focused on demographics, exposure to patients with HIV, and attitudes towards patients with HIV. Eight additional questions were analysed for cohorts from 2014 to 2017. These questions focused on a participant's ability to recall various HIV learning experiences and their satisfaction with clinical exposure during attachment to an HIV clinic. We divided students into groups according to their

willingness to provide HIV care in the future. An unwilling student chose “strongly agree” or “agree” (on a four-point scale for cohorts from 2007 to 2010 and a six-point scale for cohorts from 2014 to 2017) when asked whether they would refuse to perform treatment or surgical procedures for patients with HIV.

### Statistical analysis

We calculated proportions of responses, along with exact binomial 95% confidence intervals (CIs). We used bivariable logistic regression to compare exposure and attitudes between participants in the 2007-2010 cohort (cohorts from 2007 to 2010) and the 2014-2017 cohort (cohorts from 2014 to 2017); each set of three cohorts was grouped together to maximise sample size. Factors associated with willingness to provide HIV care were analysed using bivariable logistic regression. SPSS software (Windows version 26; IBM Corp., Armonk [NY], United States) was used for data management and statistical analyses. Two-sided P values <0.05 were considered statistically significant.

## Results

### Participant characteristics

In total, 1050 final-year students participated in the survey. Three cohorts of final-year medical students participated between 2007 and 2010 (n=546); three additional cohorts of final-year medical students participated between 2014 and 2017 (n=504). The response rates were 97% in the 2007-2010 cohort and 91% in the 2014-2017 cohort. Table 1 shows the detailed characteristics, exposure, and attitudes among the surveyed students. There was no difference in gender between the 2007-2010 and 2014-2017 cohorts (odds ratio [OR]=1.14; 95% CI=0.89-1.46).

### Participant exposure

Significantly fewer students (39.3%) in the mid-2010s initially encountered patients with HIV during attachment to an HIV clinic, compared with students in the late 2000s (72.1%; OR=0.25; 95% CI=0.18-0.34) [Table 1]. The proportion of students who personally knew HIV-positive friends or relatives remained low

TABLE 1. Medical students' exposure to and attitudes towards patients with HIV: comparison between cohorts\*

	2007-2010 cohort	2014-2017 cohort	Odds ratio (95% confidence interval)	P value
Gender	n=525	n=497		
Female	293 (55.8%)	261 (52.5%)		
Male	232 (44.2%)	236 (47.5%)	1.14 (0.89-1.46)	0.29
Exposure to patients with HIV				
Initially encountered patients with HIV during attachment to an HIV clinic	n=312	n=478		
No	87 (27.9%)	290 (60.7%)		
Yes	225 (72.1%)	188 (39.3%)	0.25 (0.18-0.34)	<0.001†
Personally knew HIV-positive friends or relatives	n=545	n=495		
No	541 (99.3%)	493 (99.6%)		
Yes	4 (0.7%)	2 (0.4%)	0.55 (0.1-3.01)	0.49
Attitudes towards patients with HIV				
Willing to provide HIV care	n=546	n=479		
No	120 (22.0%)	104 (21.7%)		
Yes	426 (78.0%)	375 (78.3%)	0.98 (0.73-1.33)	0.99
Prefer to avoid work in a field involving HIV/AIDS	n=517	n=480		
No	428 (82.8%)	429 (89.4%)		
Yes	89 (17.2%)	51 (10.6%)	0.57 (0.4-0.83)	0.003†
Planning to specialise in HIV medicine	n=517	n=480		
No	506 (97.9%)	427 (89.0%)		
Yes	11 (2.1%)	53 (11.0%)	5.71 (2.95-11.07)	<0.001†

Abbreviation: HIV = human immunodeficiency virus

\* Data are shown as No. (%), unless otherwise specified

† P<0.05

and did not significantly differ over time (OR=0.55; 95% CI=0.1-3.01). In the 2007-2010 and 2014-2017 cohorts, only four of 545 students (0.7%) and two of 495 students (0.4%), respectively, personally knew HIV-positive friends or relatives.

### Participant attitudes

Student willingness to provide HIV care was similar between cohorts (Table 1). Approximately 78% of students were willing to provide care (OR=0.98; 95% CI=0.73-1.33). The proportion of students who preferred to avoid work in a field involving HIV/AIDS significantly decreased over time: 17.2% in the 2007-2010 cohort, compared with 10.6% in the 2014-2017 cohort (OR=0.57; 95% CI=0.4-0.83). An increasing number of students planned to specialise in clinical HIV treatment: 11 of 517 students (2.1%) in the 2007-2010 cohort, compared with 53 of 480 students (11%) in the 2014-2017 cohort (OR=5.71; 95% CI=2.95-11.07).

There was no difference in gender between willing and unwilling students (OR=1.24; 95% CI=0.92-1.68) [Table 2]. Unwilling students were more likely than willing students to have initially encountered patients with HIV during attachment to an HIV clinic (61.4% vs 50.9%) [OR=1.53; 95% CI=1.07-2.19]. Willingness was not associated with personally knowing HIV-positive friends or relatives. In the 2014-2017 cohort, most students (80.3%) recalled their attachment to an HIV clinic, whereas fewer than half could recall other components of the HIV curriculum (lectures and ward rounds; 14.5-48.7%). Notably, the ability to recall attachment to an HIV clinic was associated with willingness (OR=0.57; 95% CI=0.34-0.96) to provide HIV care. Ratings of the content and format of the attachment to an HIV clinic were not associated with willingness (OR=0.94; 95% CI=0.58-1.50 and OR=0.79; 95% CI=0.50-1.27, respectively). Overall, most students (97.5%) have encountered >1 patient with HIV during clinical attachment. Unwilling students (5/71, 7%) were less likely than willing students (4/295, 1.4%) to have encountered any patients with HIV during clinical attachment.

### Discussion

Human immunodeficiency virus prevalence has risen over time<sup>8</sup> with advances in antiretroviral therapy that contribute to prolonged survival; this pattern has been observed in nearly all countries, irrespective of the initial HIV prevalence. Thus, it is unsurprising that exposure to patients with HIV/AIDS increased over time among medical students in our study. Nevertheless, Hong Kong remains a low prevalence setting for HIV/AIDS<sup>9</sup>; therefore, the number of students who personally knew HIV-positive friends or relatives has remained low. Despite predictable trends in exposure to

patients with HIV since the late 2000s, some students maintained negative attitudes towards patients with HIV. Although exposure to patients with HIV has increased, the proportion of students unwilling to provide HIV care did not change between the late 2000s and middle 2010s. The proportion of unwilling students in our study is higher than that in a similar study conducted in 2011 in Malaysia, where 10% to 15% of students reported unwillingness to provide HIV care.<sup>10</sup> Because medical students are future healthcare providers, their unwillingness to provide HIV care represents an extreme manifestation of stigma, which has been a problem since the HIV/AIDS epidemic began.<sup>11</sup>

Stigma can have subtle effects, which may influence career choices. A previous study found that these effects can diminish over time<sup>12</sup>; our results are consistent with that finding. While a large proportion of students did not plan to work in a field involving HIV, such plans may be related to personal preferences for medical disciplines that facilitate career development and job opportunities, although discrimination cannot be ruled out. However, the present study showed that, over time, fewer students have reported that they prefer to avoid working in a field involving HIV/AIDS. Encouragingly, increasing numbers of students are planning to specialise in clinical HIV treatment. “Interest” has been most frequently cited as the main reason for choosing a specialty; thus, interest in HIV/AIDS may be increasing among medical students.<sup>13</sup> However, the proportion of students who intended to specialise in clinical HIV treatment was lower in our study than in a previous study in the United Kingdom, where 8% to 24% of students reported such an intention.<sup>14</sup>

Clinical attachment with patient exposure appears to be an effective learning experience. In the current system, some students may have overlooked and missed the opportunity to encounter a patient with HIV/AIDS. We found that, compared with willing students, a higher proportion of students unwilling to provide HIV/AIDS care had not encountered a patient with HIV/AIDS during their clinical attachment. This difference may be attributed to a lack of exposure to patients with HIV/AIDS during the medical school curriculum. Students may benefit from repeated exposure to patients with HIV/AIDS in different settings—willing students were more likely to have previously encountered a patient with HIV/AIDS. Further research is needed to determine whether students could be exposed to patients with HIV outside clinical settings (eg, through non-governmental organisations) and to understand the impacts of such exposure. Willing students were more likely to recall their attachment to an HIV clinic, compared with other teaching methods; this suggests that their emotions were aroused, which prompted recall.<sup>15</sup>

TABLE 2. Factors associated with medical student willingness to provide HIV care\*

	Willing	Unwilling	Odds ratio (95% confidence interval)	P value
Gender	n=782	n=216		
Female	433 (55.4%)	108 (50.0%)		
Male	349 (44.6%)	108 (50.0%)	1.24 (0.92-1.68)	0.16
Initially encountered patients with HIV during attachment to an HIV clinic	n=611	n=158		
No	300 (49.1%)	61 (38.6%)		
Yes	311 (50.9%)	97 (61.4%)	1.53 (1.07-2.19)	0.02†
Personally knew HIV-positive friends or relatives	n=798	n=218		
No	795 (99.6%)	215 (98.6%)		
Yes	3 (0.4%)	3 (1.4%)	3.7 (0.74-18.45)	0.11
Able to recall (for 2014-2017 cohort only)				
Microbiology lecture	n=371	n=99		
No	265 (71.4%)	70 (70.7%)		
Yes	106 (28.6%)	29 (29.3%)	1.04 (0.64-1.69)	0.89
Community medicine lecture	n=372	n=98		
No	191 (51.3%)	56 (57.1%)		
Yes	181 (48.7%)	42 (42.9%)	0.79 (0.51-1.24)	0.31
HIV lecture	n=351	n=98		
No	240 (68.4%)	73 (74.5%)		
Yes	111 (31.6%)	25 (25.5%)	0.74 (0.45-1.23)	0.25
Attachment to an HIV clinic	n=364	n=99		
No	64 (17.6%)	27 (27.3%)		
Yes	300 (82.4%)	72 (72.7%)	0.57 (0.34-0.96)	0.03†
Medical ward rounds	n=359	n=99		
No	307 (85.5%)	85 (85.9%)		
Yes	52 (14.5%)	14 (14.1%)	0.97 (0.51-1.84)	0.93
Attachment content rating	n=361	n=98		
<5	114 (31.6%)	33 (33.7%)		
5-6	247 (68.4%)	65 (66.3%)	0.94 (0.58-1.50)	0.79
Attachment format rating	n=364	n=100		
<5	109 (29.9%)	35 (35.0%)		
5-6	255 (70.1%)	65 (65.0%)	0.79 (0.50-1.27)	0.33
No. of patients with HIV encountered in clinic	n=295	n=71		
0	4 (1.4%)	5 (7.0%)		
1	45 (15.3%)	8 (11.3%)	0.14 (0.03-0.65)	0.01†
2	122 (41.4%)	31 (43.7%)	0.20 (0.05-0.80)	0.02†
3	107 (36.3%)	21 (29.6%)	0.16 (0.04-0.63)	0.01†
4	15 (5.1%)	4 (5.6%)	0.21 (0.04-1.19)	0.08
5	2 (0.7%)	2 (2.8%)	0.80 (0.08-8.47)	0.85

Abbreviation: HIV = human immunodeficiency virus

\* Data are shown as No. (%), unless otherwise specified

† P<0.05

Previous research has shown that teaching methods with experiential, small group, or affective components and role models of positive attitudes can effectively change students' attitudes.<sup>14</sup> Such considerations may be useful in clinics where small numbers of students observe patient management by a specialist physician. If a student is emotionally affected by a patient or sees the clinician as a good

role model, the clinical attachment may constitute a memorable experience. This may be more important than gaining technical knowledge and skills through the clinical attachment experience because content and format were not associated with willingness to provide HIV care. Our results are consistent with the findings of previous studies, which showed that frequent clinical exposure to patients with HIV/AIDS led to more positive attitudes.<sup>14,16-20</sup> Furthermore, knowledge alone cannot effectively decrease HIV stigma<sup>21</sup>; similarly, we found that the ability to recall lectures was not associated with willingness to provide care for patients with HIV/AIDS. However, increased exposure alone may be insufficient to combat HIV stigma. Antibias information is also needed to reduce prejudice,<sup>22</sup> such as homophobia, which has been associated with unwillingness to provide care for patients with AIDS.<sup>12</sup> Medical training should address these issues that contribute to stigma towards patients with HIV/AIDS. Notably, medical students reportedly demonstrated increased willingness to provide care for patients with HIV/AIDS after they had attended an PLHIV sharing session or participated in experiential games that were designed to increase empathy towards PLHIV.<sup>23</sup> In another study, HIV stigma levels decreased in medical students after exposure to an intervention that included discussion of HIV stigma and other pre-existing related stigmas (eg, homosexuality and illegal drug use).<sup>24</sup>

This study had some limitations. First, it was a comparison of cross-sectional surveys over a 10-year period and thus we were unable to assess potential changes in attitudes among medical students within a single cohort. Second, each cohort used in comparative analysis was composed of three annual cohorts; therefore, time intervals varied among cohorts (eg, the 2007 and 2017 cohort were separated by 10 years, whereas the 2010 and 2014 cohorts were separated by 4 years). Nevertheless, we grouped cohorts together to maximise sample size; our analysis clearly showed changes in attitudes among medical students over time.

## Conclusions

Despite more positive attitudes towards HIV/AIDS in terms of career choices, the willingness of medical students to provide HIV care did not change between the late 2000s and middle 2010s.

Interventions to reduce stigmatising attitudes among towards PLHIV should be incorporated in medical training; however, the framework for medical school curriculum in Hong Kong makes no mention of such interventions, although it lists “attitudes and professionalism” as a core competency.<sup>25</sup> The medical school curriculum could be updated to incorporate interventions that involve experiential and affective teaching components to

adequately address HIV stigma; additional clinical attachments can ensure that medical students have adequate exposure to patients with HIV.

## Author contributions

Concept or design: G Tam, SS Lee.

Acquisition of data: SS Lee.

Analysis or interpretation of data: NS Wong.

Drafting of the manuscript: All authors.

Critical revision of the manuscript for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

## Conflicts of interest

The authors declare that they have no competing interests,

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## Ethics approval

This study was approved by the Survey and Behavioural Research Ethics Committee, The Chinese University of Hong Kong (Ref 12-01-2011). Participation was voluntary and completion of the survey implied consent to participate in the study. All data were anonymised and confidential.

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