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Short Communication

# Participation in cancer screening among people living with HIV at a university hospital



Pei-Ying Wu <sup>a</sup>, Hsin-Yun Sun <sup>b</sup>, Mao-Yuan Chen <sup>b,1</sup>,  
Wang-Huei Sheng <sup>b</sup>, Szu-Min Hsieh <sup>b</sup>, Yu-Chung Chuang <sup>b</sup>,  
Hsi-Yen Chang <sup>a</sup>, Yu-Zhen Luo <sup>a</sup>, Jun-Yu Zhang <sup>a</sup>,  
Chien-Ching Hung <sup>b,c,d,e,\*</sup>

<sup>a</sup> Center of Infection Control, National Taiwan University Hospital, Taipei, Taiwan

<sup>b</sup> Department of Internal Medicine, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan

<sup>c</sup> Department of Tropical Medicine and Parasitology, National Taiwan University College of Medicine, Taipei, Taiwan

<sup>d</sup> Department of Medical Research, China Medical University Hospital, Taichung, Taiwan

<sup>e</sup> China Medical University, Taichung, Taiwan

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**Abstract** Between March and October, 2018, 1248 people living with HIV completed questionnaire interviews for cancer screening, of whom 46.9% (n = 585) completed free-of-charge cancer screening. Time constraint (50.1%) was the most common reason provided for refusal to participate in cancer screening. None of the participants were diagnosed with any of the four cancers.

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## Introduction

Widespread use of combination antiretroviral therapy has markedly decreased mortality and morbidity in people living with HIV (PLWH).<sup>1</sup> The declines in the incidences of opportunistic infections and AIDS-defining cancers have been accompanied by a dramatic increase in the incidence of non-AIDS-defining cancers (NADCs).<sup>2</sup> Cancer has emerged as a leading cause of morbidity and mortality in PLWH.<sup>2</sup>

\* Corresponding author. Department of Internal Medicine, National Taiwan University Hospital, 7 Chung-Shan South Road, Taipei, Taiwan. Fax: +886 2 23832172.

E-mail address: [hcc0401@ntu.edu.tw](mailto:hcc0401@ntu.edu.tw) (C.-C. Hung).

<sup>1</sup> deceased.

Some NADCs also occur excessively in PLWH compared with the general population, especially lung cancer, Hodgkin disease, anal cancer, and liver cancer.<sup>3</sup> Based on the practices in the general population, cancer screening among PLWH are increasingly important.<sup>3</sup> In the US, the consensus guidelines recommend screening for cancers involving the cervix, colon, breast and lung in the general population.<sup>3</sup> For PLWH, the European AIDS Clinical Society (EACS) guidelines recommend screening for cancers involving the cervix, colon, breast, anal, liver and prostate.<sup>4</sup>

The Taiwan National Cancer Screening Program was first implemented in 1985 by providing Pap smears for women. At the same time, trial-based screening programs were initiated for colorectal, breast, and oral cancers in high-risk groups.<sup>5</sup> The Program has expanded the free-of-charge screening services for four cancers since 1999, including oral, colorectal, cervical and breast cancers, four of the ten leading causes of cancer death in Taiwan.<sup>5</sup> To facilitate early diagnosis and to reduce the disease burden, cancer screening has been promoted among the eligible individuals at health care facilities around Taiwan.

While PLWH are ageing, an increasing number of patients will become eligible for cancer screening in Taiwan. However, studies of cancer screening among PLWH remain scarce in Taiwan. In this cross-sectional study, we aimed to investigate the status of participation in the national cancer screening among PLWH seeking care at a university hospital in Taiwan.

## Materials and methods

### Study setting

This cross-sectional survey was conducted at the outpatient clinic of the National Taiwan University Hospital between March 1 and October 31, 2018. PLWH were informed of the cancer screening program for four cancers (oral, colorectal, breast, and cervical cancer) and were assessed for eligibility for participation. Eligible PLWH who were willing to complete the questionnaire interview and participate in cancer screening were linked to the clinics that provided the screening services at the hospital. The study was approved by the Research Ethics Committee of the hospital (201003112R).

### Oral cancer screening

Since 2004, the nationwide biennial screening program for the early detection of oral neoplasia has targeted high-risk individuals with habits of cigarette smoking and/or betel quid chewing, including aboriginal adults aged 18–30 years and adults aged  $\geq 30$  years.<sup>5</sup> The eligible participants undergo visual inspection of the oral cavity by trained dentists or physicians. Clinical diagnoses of oral leukoplakia, erythroleukoplakia, erythroplakia, oral submucosa fibrosis, and verrucous hyperplasia are defined as oral pre-malignancy. The participants with clinical findings consistent with oral pre-malignancy are referred to specialists for confirmatory pathologic examination.

### Colorectal cancer screening

Before the commencement of the full program in 1999, a pilot trial of colorectal cancer screening with the use of fecal immunochemical test (FIT) (Eiken OC Sesor) was conducted in Keelung, Taiwan.<sup>6</sup> Based on the results of the pilot program, the government launched the nationwide colorectal cancer screening program in 2004. Individuals aged 50–69 years were eligible for biennial screening from 2004 to 2009, and the age limit was increased to 75 years in 2013.<sup>7</sup> Participants with positive results are notified by phone call and referred for colonoscopy.<sup>7</sup>

### Cervical cancer screening

In 1995, the National Cervical Cancer Screening Registry was established to identify women for Pap smear examinations and monitor whether any screening-detected abnormalities were followed and treated. To eliminate the financial barrier to accessing Pap smear examinations, the National Health Insurance covers the fee for examinations for women over 30 years of age.<sup>8</sup> The eligible participants undergo Pap smear examinations by trained family physicians. Participants with positive results are referred for examination by gynecologists.

### Breast cancer screening

Since 2004, a nationwide biennial screening mammography program has been offered free-of-charge to asymptomatic women. At its inception, the program covered women aged 50–69 years, which has been expanded to cover women aged 45–69 years since December 2009.<sup>9</sup> Participants with positive results are referred for assessment by surgeons.

## Results

During the 8-month period, 1467 PLWH met the screening criteria and 1248 (85.1%) completed questionnaire interviews (Fig. 1). Their clinical characteristics are shown in Table 1. Overall, 46.9% (585/1248) of the participants completed cancer screening, which included 36.9% (324/877) for oral cancer, 57.1% (305/534) with FIT screening for colorectal cancer, 37.6% (38/101) of women with Pap smear examination for cervical cancer and 25.7% (18/70) of women with digital breast tomosynthesis for breast cancer (Fig. 1).

Of 324 participants who underwent oral cancer screening, 47 (14.5%) had abnormal oral screening results, of whom 38 (80.9%) completed follow-up at the dental clinics. Of 38 participants with homogeneous thick and thin leukoplakia or submucosa fibrosis, 4 were referred for biopsy and none were diagnosed with oral cancer.

Of 305 participants who underwent colorectal cancer screening, 24 (7.9%) had FIT-positive results and 20 (83.3%) were referred for colonoscopy; none were diagnosed with colorectal cancer. By colonoscopy, polyps were identified in the colon in 3 participants, tubular adenoma in 8, hemorroids in 8 and negative finding in 10.

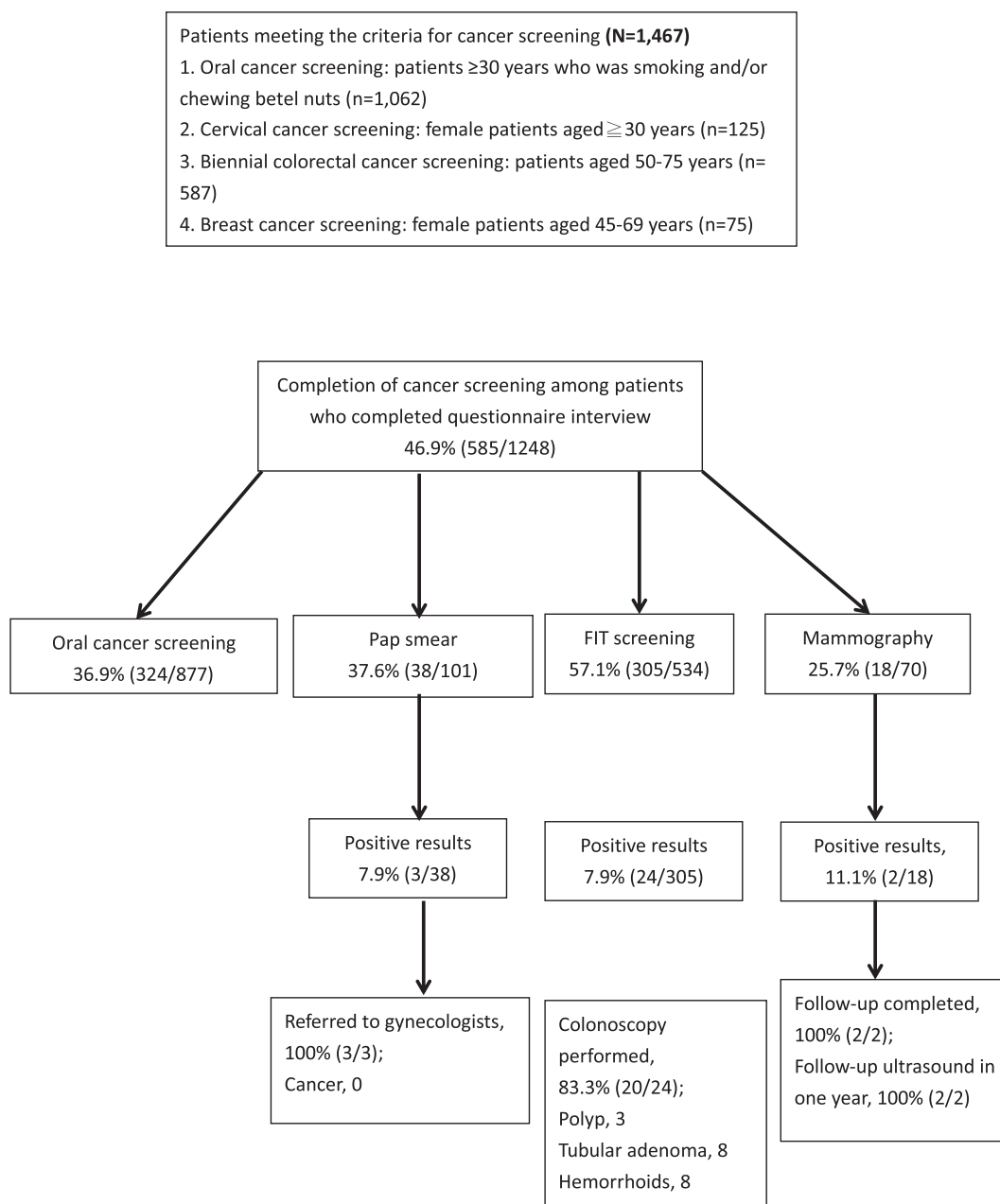


Figure 1. Flow chart.

Pap smear examination was performed in 38 (37.6%) women and 3 (7.9%) with abnormal results were referred for gynecological assessment. After colposcopy and biopsy, a diagnosis of endocervical polyp, high-grade squamous intraepithelial lesion and inflammation was made in one participant each. The participant with high-grade squamous intraepithelial lesion underwent loop electrosurgical excision procedure with no recurrence during the subsequent follow-up for 1 year or more.

Digital breast tomosynthesis was performed in 18 (25.7%) women, two of whom had abnormal results. These two participants completed follow-up every 6–12 months with breast ultrasonography for 1 year or more.

Overall, 483 participants (38.7%) refused cancer screening because 158 (32.7%) reported having had

screening before, 242 (50.1%) having no time, and 83 (17.2%) other miscellaneous reasons (Table 1).

## Discussion

In this survey, we found that the cancer screening rates of oral, colorectal, cervical, and breast cancers among PLWH were lower or similar to those in the nationwide population-based screening program in Taiwan: oral cancer, 55.1% vs 36.9%<sup>10</sup>; colorectal cancer, 56.6% vs 57.1%<sup>7</sup>; cervical cancer, 55.5% vs 37.6%<sup>6</sup>; and breast cancer 33.2% vs 25.7%.<sup>9</sup> Several reasons for the discrepancies observed may exist, other than the awareness of the screening programs and willingness of PLWH to participate, and the motivation

**Table 1** Characteristics of the eligible patients for cancer screening.

Characteristic	N = 1248
Male, n (%)	1145 (91.7)
Age, mean (SD), years	46.6 (10.5)
Participation in cancer screening, n (%)	585 (46.9)
Body-mass index, mean (SD), kg/m <sup>2</sup>	23.3 (3.5)
Alcohol consumption, n (%)	333 (26.7)
Betel nut chewing, n (%)	
Never	1167 (93.5)
Past	70 (5.6)
Current	11 (0.9)
Education level, n (%)	
None	8 (0.6)
Primary school	50 (4.0)
Secondary school	108 (8.7)
High school	337 (27.0)
University or college	607 (48.6)
Master	138 (11.1)
Smoking status, n (%)	
Never	300 (24.0)
Past	115 (9.2)
Current	833 (66.7)
<10 years	215 (25.8)
>10 years	618 (74.2)
Refusal of cancer screening, n (%)	596 (47.8)
Reason of refusing cancer screening (n = 483)	
Testing performed before, n (%)	158 (32.7)
Time constraint	242 (50.1)
Others	83 (17.2)
Family history of cancer, n (%)	
Colon cancer	90 (7.2)
Breast cancer	70 (5.6)
Liver cancer	97 (7.8)
Lung cancer	92 (7.4)
Oral cancer	18 (1.4)
Cervical cancer	45 (3.6)
Prostate cancer	22 (1.8)
Stomach cancer	28 (2.2)
Nasopharyngeal cancer	14 (1.1)

of health care providers to promote. The national program are outreach, community-based mass screening program that provides flexible screening approach to the community residents rather than a program of opportunistic screening or case finding conducted in clinics or hospitals such as our study.<sup>6</sup> A significant proportion of our PLWH (50.1%) declined to participate in the screening because of time constraint. Another reason for higher screening rates in national program may be that multiple screening activities are integrated together, which may be more efficient in the invitation for participation, collection of baseline information, and decisions on the eligibility.<sup>6</sup>

A previous study by Corrigan et al. has shown that both low income level and lower educational attainment were associated with lower rate of cancer screening; moreover, patients who were able to attend regular appointments with their infectious disease physicians or primary care

providers might be more likely to remain up to date with their cancer screening.<sup>10</sup> In the multivariate analyses of our study, we found that an older age (adjusted odds ratio [OR], 1.049; 95% CI, 1.036–1.062) and having a family history of cancers (adjusted OR, 1.356; 95% CI, 1.055–1.742) were associated with participation in cancer screening (data not shown).

Compared with the referral rate in the nationwide population-based screening program in Taiwan, the rate for further oral cancer examination is lower in our study (80.9% vs. 91.1%)<sup>11</sup>; in contrast, the rate of referral for colonoscopy in our study is higher than that in the population-based screening program (83.3% vs. 67.1%).<sup>6</sup> The referral rate of cervical cancer examination is the same with that in the population-based screening program (100% vs. 100%).<sup>6</sup> Though the case number remains very small, the rate for breast cancer examination is higher than that in population-based screening program (100% vs. 2.87%).<sup>6</sup> While time constraint might play a role in the willingness of referral of the participants with abnormal screening results, linkage to advanced examinations at the same hospital with the assistance of HIV case managers might improve the referral rates.

This study has several limitations. First, the hospital-based setting for cancer screening may be limited by short encounter time for providing the information on the program to all PLWH attending the clinics who might be eligible for cancer screening. Second, the study only recruited participants at one hospital, which limits the inference of the results. Third, female patients accounted for only a small proportion of PLWH at this university hospital.<sup>1</sup>

In conclusion, we found that less than 50% of the eligible PLWH seeking HIV care at the university hospital participated in the free-of-charge cancer screening for oral, colorectal, cervical and breast cancers. As the majority of PLWH are engaged in HIV care at designated hospitals and clinics in Taiwan, multidisciplinary approach is warranted to promote awareness and willingness of cancer screening among health care providers and PLWH. To improve the efficiency and clinical applicability of cancer screening among PLWH, integration with community cancer screening program should be considered to alleviate the concerns about time constraint and stigma, followed by referral and linkage to confirmatory examinations and appropriate subspecialty care at the HIV care facilities.

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