Cancer Incidence and Survival in Metro Manila and Rizal Province, Philippines

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The database of two population-based cancer registries (Philippine Cancer Society-Manila Cancer Registry and Department of Health-Rizal Cancer Registry) was used to generate age-standardized incidence rates of cancer during 1980–2002. Five-year relative survival rates were obtained for incident cases from 1993 to 2002 using a period analysis method. Overall incidence had increased in both males and females. Among males, lung cancer was the leading cancer and reached a peak in 1988–92. Colorectal and prostate cancers showed rising trends and became more common than liver cancer, with stable incidence over time. Stomach cancer incidence fell steeply. Among females, there was a steady increase in incidence of breast cancer. There was a slight decrease in the incidence of the second common cancer, cervical cancer, and colorectal cancer became equally common. Lung cancer incidence in females also reached a peak by 1998–2002 and then slightly decreased. Oral cavity cancer decreased strongly in the last period. In general, survival rates among Philippine residents were one-third lower than among Filipino-Americans and Whites in the USA especially in cancer sites wherein effective early detection methods may be available such as breast, cervix, colorectal and thyroid cancers. Survival was also lower in Philippine leukemia cases, a disease wherein effective treatment is proven in some types but is quite expensive. Lifestyle factors such as smoking, unhealthy diet, physical inactivity, and human papillomavirus and hepatitis B virus infections were associated with some incidence patterns. Late stage at diagnosis was largely responsible for low survival.

Key words: Philippine cancer incidence and survival

INTRODUCTION

In 2008, an estimated 12.4 million new cancer cases and 7.6 million deaths from cancer would have occurred worldwide. More than half of the new cases would have occurred in WHO regions which have large proportions of low- and middle-income countries, and 29.7% of new cancer cases would have occurred in the WHO-Western Pacific Region (WHO-WPRO) (1). Some general information on the cancer burden in specific countries are available and accessible through the Internet, such as those published by the WHO...
and the International Agency for Research on Cancer (IARC) publications such as the Cancer Incidence in Five Continents (CI5) series, World Cancer Report series and the very useful estimation tool GLOBOCAN, all downloadable in CANCER Mondial (www-dep.iarc.fr/). Many developing countries lack an efficient method of storing and disseminating local information relevant to the control of the growing number of non-communicable diseases (NCDs), so that information from developing countries that may be relevant to understanding patterns in incidence, mortality and survival are difficult to obtain. Such information would add to the growing evidence that similar lifestyle factors affect many NCDs including cancer and that these lifestyle factors such as smoking (2), unhealthy diet and physical inactivity (3,4) have comparable effects on populations in both developed and developing countries (1). The survival benefits of early detection and adequate treatment, such as those reported for breast and cervix cancers, as well as the dire consequences of delayed detection, seem to be present across all economic strata (1).

It is the objective of this paper to review available publications that may help to understand and explain cancer incidence and cancer survival of selected cancer sites in Metro Manila and Rizal province in the Philippines.

PATIENTS AND METHODS

Incidence and survival were derived from the databases of the Philippine Cancer Society-Manila Cancer Registry and the Department of Health-Rizal Cancer Registry. These two population-based registries have contributed incidence data to the IARC CI5 series from Volume 5 (1978–82) up to Volume 9 (1998–2002). The Philippine Cancer Society had also produced the Cancer in the Philippines series, Volume 1, as an IARC technical Report (5) and the latest, Volume 4, with tables and color figures illustrating differences in age-standardized rates (ASRs) between cities and municipalities, in cooperation with the Finnish Cancer Registry (6). The registries cover an area of 1978 km² with a population of 11.2 million (2000 Census). The area includes the city of Manila, the oldest highly urbanized city in the country, and eight other cities and seven municipalities that constitute Metro Manila. Most cities and municipalities in Metro Manila are highly urbanized. To the east are the 14 mostly rural municipalities of Rizal province. The cancer sites chosen for cancer incidence were those with known dominant risk factors and established prevention methods, and/or proven methods for early detection and adequate treatment. For males, these were the lung, liver, oral cavity, stomach, colon–rectum, prostate and thyroid. For females, the lung, liver, oral cavity, stomach, colon–rectum, breast, cervix and thyroid cancers were included.

Cancer survival observed in a Philippine population had been described (7,8) and a second series on cancer survival is about to be published by the IARC. However, the report that will be used in this review article, on 1993–2002 incident cases randomly selected among Metro Manila residents, is the most recent report from a project supported by the German Cancer Research Center. The included sites were the lung, liver, stomach, colorectum, breast, cervix, ovary, thyroid and leukemia. Five-year relative survival rates (RSRs) were calculated using period analysis and were compared with Filipino-Americans and Caucasian residents in the USA using the SEER 13 database (9,10).

Ongoing efforts at obtaining relevant information on factors influencing incidence and survival were intensified. Data sources included Philippine scientific journals, the Department of Health-National Center for Disease Prevention and Control (DOH-NCDPC), Food and Nutrition Research Institute (FNRI) and Philippine Statistics Office.

RESULTS AND DISCUSSION

Male lung cancer reached a peak in 1988–92 and then slightly declined (Fig. 1 and Table 1). Liver cancer showed minimal change. Colorectal and prostate cancer incidence had risen, whereas stomach cancer steeply fell. Oral cavity cancers also declined, whereas there was a slight increase in thyroid cancer ASR.

In women, lung cancer incidence also reached a peak by 1998–2002 and then slightly decreased (Fig. 2 and Table 2). Stomach cancer incidence likewise decreased, whereas colorectal had been steadily increasing. There was a steady increase in breast cancer ASR. Cervix cancer incidence slightly decreased. Oral cavity cancer had decreased, whereas thyroid cancer had increased, showing in the last period steeper relative increase than thyroid cancer in men or any other cancer in women.

Figure 1. Age-standardized incidence rates of leading cancer sites among males during five time periods in Metro Manila and Rizal province, Philippines, 1980–2002.
In general, survival among Metro Manila residents were much lower in cancer sites wherein effective early detection methods may be available, such as breast, cervix, colorectal and thyroid cancers (Table 3). Survival among Metro Manila residents was also much lower among leukemia cases, a disease wherein effective treatment is proven in some types but is quite expensive. The survival differences were not as huge in cancers where no effective early detection methods are available such as lung, liver, stomach and ovarian cancers (9).

ALL SITES

The All Sites ASRs during 1980–82 among males and females were 171.2 and 170.2, respectively (5). By 1998–2002, the ASRs had risen to 194.1 in males and 192.7 in females. Higher ASRs (>168 per 100 000) were observed in the city of Manila and some highly developed cities nearby, whereas lower rates (<126 per 100 000) were seen in the less developed municipalities of Rizal province. The pattern among women was similar (6). Economic development accelerated during the 1950s, starting in the city of Manila and had progressed eastward, but still had not equally involved some municipalities in Metro Manila and Rizal province. This may partly account for the variation in ASRs, particularly in so-called lifestyle-related cancers.

LUNG CANCER

Lung cancer is currently the most common cause of cancer deaths worldwide.

Since no effective screening method is available, survival is poor. Tobacco smoking accounts for at least 80% of all
lung cancers (1). Secondhand smoke (SHS) may also increase the risk of lung cancer and other NCDs (11).

The 1998–2002 lung cancer ASRs manifested the same pattern of variation between cities/municipalities observed for All Sites, colorectal and breast cancers (6). In 1989, a National Smoking Prevalence Survey reported that the prevalence of smoking among males and females was 64.2% and 18.8%, respectively (12). By 1999, it was estimated that 17.9 million Filipinos (47% of adults) would have a history of smoking, and at least another 26.4 million (35% of the total population) exposed to SHS (13). The 2003–04 National Nutrition and Health Survey (NNHeS) showed that the overall prevalence of Filipinos currently smoking was 34.8% (56.3% among males and 12.1% in females). The proportion among males and females who never smoked was 28.6% and 55.0%, respectively (14).

The high 5-year RSR among Filipino-Americans (37.8%) compared with Whites (17.3%) and Metro Manila residents (12.0%) is difficult to explain (9).

LIVER CANCER

In Africa and most of Asia, hepatocellular carcinoma (HCC), which accounts for most cases of primary liver cancer, is most frequently caused by chronic hepatitis B virus (HBV) infection. Concomitant exposure to aflatoxin increases the risk. HBV vaccination of pregnant women, infants and young children may already be resulting in a substantial decrease in the prevalence of the HBV carrier rate in some populations. Survival is poor as there is no effective screening method (1).

The seminal body of work on HBV infection and HCC in the Philippines had been produced by the Liver Study Group (LSG) of the University of the Philippines Manila. The hepatitis B surface antigen (HBsAg) positivity rates in 104 histologically verified HCC cases and 84 asymptomatic controls were 70% and 18%, respectively (15). An association between dietary aflatoxin and HCC was clearly demonstrated (16) in the 1970s, but subsequent aflatoxin studies are unavailable. Among patients with acute sporadic icteric viral hepatitis, 55% were caused by hepatitis A virus and 29% by HBV (17). Among pregnant and puerperal women, HBV exposure was 59.7% (56.7–66.7%) and HBsAg positivity rate was 9.2% (6.0–10.5%) (18). Most new HBV cases occurred in the young and were clinically not apparent, and susceptibility to the infection declined with age (19). It was estimated that 5 million Filipinos were HBsAg-positive from seroepidemiological surveys conducted in 1979–82 (20). Mother-to-infant transmission accounted for about one-third of HBsAg positivity at 1 year of age (21). A later report on archived serum samples showed the HBsAg positivity rates of 5–9% in healthy adults, 45.7% in chronic liver disease cases, 5.6% among multiply transfused persons and 8.7% among patients undergoing hemodialysis (22). A point prevalence study showed that less than 2% of either voluntary or commercial blood donors, and 7% of cases with chronic hepatitis and/or cirrhosis, had antibodies to hepatitis C virus (23). Since 95.5% of HCC were unresectable, the LSG also participated in the early trials of chemotheraphy. The results were disappointing since only around one-third of cases had some response, and the duration was short (24,25).

Up to now, no real community-wide HBV vaccination had occurred in the Philippines so that the ASRs are practically unchanged in both sexes. The variability in ASRs between cities/municipalities was not as clearly shown as in All Sites, lung, colorectal and breast cancers (6). The presence of large colonies of informal settlers in some cities could have resulted in wider HBV transmission.

Survival of liver cancer patients is poor in the Philippines as it is everywhere. The 5-year RSRs of Metro Manila residents, Filipino-Americans residing in the USA and Whites were 8.5%, 11.7% and 12.3%, respectively (9).

STOMACH CANCER

Stomach cancer is no longer the world’s most common cancer, and a steady decrease in the incidence and mortality rates of stomach cancer had been observed for several decades in many countries worldwide. This decrease may be partly attributable to changes in food preservation, such as refrigeration instead of salting or smoking. There is currently no screening method appropriate for most countries (1).

The city/municipality variations in both sexes are not as well delineated when compared with those observed in All Sites, lung, colorectal and breast cancers (6). The 5-year RSR of Metro Manila residents was 27%. The RSR of Filipino-Americans (31%) was significantly higher than Caucasians (23%) in the USA and could be because of a higher proportion of non-cardia stomach cancer in Filipino-Americans (9).

ORAL CAVITY CANCER

Tobacco smoking, alone or in combination with alcohol consumption, is the most important risk factor for head and neck cancers (1). Betel quid and areca nut chewing which were quite prevalent in India and Southeast Asia is also an established risk factor (26).

Several habits had been associated with oral cavity cancer in the Philippines and included betel nut chewing and inverted cigarette smoking (27–30). Betel quid chewing was moderately popular in the country particularly among rural folks, but had progressively declined among succeeding generations who had attained higher economic status and education. Nevertheless, in 1998–2002, high oral cancer rates among women were still observed among females in the cities of Manila, Quezon, Pasay and Mandaluyong (6). These cities have relatively higher proportions of informal settlers who could have migrated to these cities from poor rural areas where the prevalence of betel quid chewing was high.
**Colorectal Cancer**

There is a wide global variation in the occurrence of colorectal cancers. The highest incidence rates are observed in developed countries. Differences in lifestyles, particularly diet, alcohol consumption and physical inactivity, may account for the global variation in incidence. Weight reduction, physical activity and smoking cessation may be preventive. There is currently no effective screening method that may be applicable in developing countries (1).

ASRs of colorectal cancer in Metro Manila and Rizal province had varied widely between cities and municipalities. By 1998–2002, rates significantly above the average were observed in four cities (ASRs 14.0–21.7) which were among the most urbanized and economically advanced in the area, whereas significantly decreased rates (ASRs 2.5–9.5) were observed in the municipalities that were the least urbanized and economically developed (6). This follows the global observation that affluence could increase the prevalence of lifestyles that increase the risk of certain cancers such as colorectal and breast cancers.

Three successive National Nutrition Surveys conducted by the Food and Nutrition Research Institute of the Department of Science and Technology (FNRI-DOST) showed that there was a progressive decline in the consumption of fruits and green leafy and yellow vegetables. In 1982, 1987 and 1992, the calculated total mean per capita per day intakes of dietary fiber were 11.5, 11.2 and 10.1 g, respectively (31). The 2003–04 NNNHeS also reported that the prevalence of obesity (body mass index >30) was 3.2% among males and 6.6% among females. Waist–hip ratio exceeded 1.0 in 12.1% of men and 0.85 in 54.8% of women. The prevalence of hypercholesterolemia, diabetes and hypertension were 8.5%, 4.6% and 17.4%, respectively (14). A survey on diabetes mellitus in 2002 reported that physical inactivity was observed in 57% of residents aged 20–65 years (32). The inactive category was defined as those whose activities involved mainly sitting or standing and only a little walking.

Although no effective population-based screening method had been implemented in the USA, the significantly higher 5-year RSRs of Filipino-Americans (62.3%) and Whites (64%) compared with Metro Manila residents (40.2%) could have indicated a higher degree of awareness and voluntary access to early detection methods (9).

Several hospital-based series had been reported covering different time periods: 1962–78 (33), 1972–80 (34), 1980–88 (35), 1995–97 (36), 1995–99 (37), 1997 (38), 1994–2000 (39) and 1999 (40). All of them reported proportions of regional/Duke’s C/TNM III stages that were higher than those reported from developed countries, ranging from 42% to 83%, with an average of 63%. The time from initial symptoms to diagnosis was more than 6 months in 50% of cases and more than a year in 30% of cases (32), and many of the reports described comparable proportions and duration of delay. About half of the responsibility for the delay was attributed to physicians who had initially managed the cases as benign conditions, mainly as hemorrhoids or amoebiasis. This was confirmed in a prospective study (38). Intestinal obstruction partial or complete, as the reason for consultation, ranged from 9% to 55%, with an average of 24%. Most of the reports cited the higher occurrence of operative morbidity and mortality among obstructed cases, and mentioned socioeconomic factors and lack of awareness among the public as well as physicians to be the main reasons for the delay in detection and treatment.

**Breast Cancer**

Breast cancer is the leading cancer among women worldwide. Reproductive factors play a major role in the causation of breast cancer. Overweight and obesity among post-menopausal women had been associated with an overall 40% increase in risk. The association with circulating sex hormones is higher in hormone receptor-positive (HR+) (estrogen/progesterone) breast cancer. Survival in developed countries had been steadily increasing and is attributed to earlier detection through screening practices and better treatment (1).

ASRs of breast cancer in Metro Manila and Rizal province showed wide variations between component cities and municipalities. Although the general pattern of inter-area variability seen in All Sites, lung and colorectal cancers implicate economic development and the resulting lifestyle changes (6), rapid development of housing areas for middle to high-income families could also have resulted in decreasing fertility. This housing development, which had started in the 1950s occurred in the cities which by 1998–2002 had significantly higher breast cancer ASRs (Fig. 3). This housing development bypassed three adjoining cities with significantly lower ASRs and two cities whose ASRs did not attain significant difference (41) A case–control study in the Philippines showed an odds ratio of 3.3 (95% CI, 1.6–6.7) in nulliparous women compared with women with six or more full term pregnancies (42).

The RSR of Philippine residents (59%) was significantly lower than among the US Filipinos (90%) and Caucasians (88%) (9).

A case–control study in Metro Manila (1988–91) had suggested that economic factors, initial non-awareness of the gravity of breast cancer and fear of being diagnosed with breast cancer could be the reasons for late diagnosis (43). The IARC attempted a population-based randomized screening trial (1995–97) using Clinical Breast Examination (CBE) by trained nurses and midwives. Even after home visits of screen-positives, only 35% eventually had a diagnostic test, suggesting that there was lack of trust in the health system and in one’s chances to be cured (44). The population-based proportion of Stage I cases in 1993–2002 did not change very much (4.1% in 1993 and 5.0% in 2002) (41). The proportion of Stage I cases among Filipino residents in the USA (1992–97) was 36.3% (45).

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1. [Source](https://academic.oup.com/jjco/article-abstract/40/7/603/835507)
In contrast, in Sarawak, Malaysia and within the context of state-supported free treatment and related travel, an adequately funded project that included increasing public awareness, training of rural health workers and empowering them with an easier referral system, resulted in a decrease of Stage III–IV breast cancer cases from 77% in 1993 to 27% in 1998 (46).

The first large hospital series from the Philippines (1966–70) reported that 23.5% were in Stage I and had a mean duration of symptoms of 15.3 months (47). Two hospital-based series from the second largest Metropolitan area in the country reported Stage I frequencies of 4.4% (1994–99) and 5.0% (2000) (48–49). Another tertiary Manila hospital reported that 4% were Stage I cases (1983–91) (50).

The estimated prevalence of both BRCA mutations among breast cancer patients from the Philippines was 5.1% (95% CI, 2.6–7.6%), and 4.1% (95% CI, 1.8–6.4%) for BRCA2 mutations alone (51). These genes are rare in most populations and explain only a small proportion (2–5%) of all cases (1).

Two population-based reports describing HR+ rates among different racial/ethnic groups in the USA reported 79% in Filipinos 50 years and older (52) and 77% among all Filipino women with breast cancer (45). Some current evidence-based practice guidelines suggest that hormonal receptor status (estrogen/progesterone) should be the starting basis for the systemic treatment of breast cancer (53,54).

There is a continuing effort at the Philippine General Hospital (PGH) to improve the quality of hormone receptor assays (HRA) (55). HR+ cases had increased from 59% to 69% ($P = 0.03$), after implementing a revised test protocol that focused on prompt fixation of specimens in buffered formalin and optimal (10–36 h) fixation. It was also reported that HR+ rates tended to be higher in core needle biopsy (CNB) specimens (72%) compared with mastectomy specimens (65%) (56). A similar observation will be reported in a still unpublished study comparing HRA results between CNB and mastectomy specimens obtained from the same patient.

A population-based survey regarding adjuvant treatment practices among 1991, 1994 and 1997 incident cases of early breast cancer reported that 97% underwent modified radical mastectomy, 18% had post-operative radiotherapy, 47% received chemotherapy and 51% had hormone therapy (mainly tamoxifen). The systemic adjuvant treatments were given in combination (cytotoxic chemotherapy and hormone therapy) in 38% of cases (57).

Among patients who underwent mastectomy at PGH (2003–05), Stage I cases comprised only 3.9% of cases, mean tumor size was 5.4 cm, and a mean of 4.6 positive
lymph nodes were found, 20.5% were Grade 3 tumors and lymphovascular invasion was seen in 10.8% of cases (58).

The 5-year RSR of Metro Manila residents (59%) was lower compared with Filipino-Americans (91%) and Caucasians (92%) in the USA (9).

CERVIX CANCER

Cervical cancer is the second most common cancer among women worldwide and around 80% occur in developing countries. It is caused by persistent infection with one or more types of the human papillomavirus (HPV), mostly sexually transmitted. Screening methods can prevent invasive cervical cancer by detecting precancerous lesions and their subsequent excision/destruction. Population-based screening in developed countries has led to marked reductions in incidence and mortality. HPV vaccination could offer a promising but still unproven method of prevention (1).

The 1998–2002 ASRs showed wide inter-area differences in Metro Manila and Rizal province, with the highest rates occurring in the most dense and economically developed cities, most likely a reflection of HPV prevalence (6). Some high-incidence cities also had a long presence of known brothels. The 2000 Family Planning Survey reported that only 1.3% of married women used condom (59). Male condom use rate in 2003 was 1.9% and 2.3% in 2008 (60).

A case–control study at PGH (1991–1993) established that HPV was the central cause of both squamous cell carcinoma (SCC) and adenocarcinoma/adenosquamous carcinoma (61). Among HPV types other than types 16 and 18, the association with SCC was strongest with HPV45. High parity, low socioeconomic status and smoking were determinants of both types of cervix cancer.

A randomized study compared acetic acid-guided visual inspection (VIA), magnified acetic acid visualization (VIAM) and two cytology-based screening methods in nine tertiary hospitals and in five municipal community health units. The authors recommended VIA or VIAM for initial screening in the Philippines (62).

Among 466 new cases seen at PGH in 2006, more than 70% presented at Stage IIB or greater, of which 40–45% were in Stage IIIB (63). Late stage at diagnosis mainly accounted for a lower RSR among Metro Manila residents (45%) compared with Filipino-Americans (67%) and Caucasians (67%) in the USA (9). The Sarawak pilot study in Malaysia also showed that it was possible to downstage Stage III–IV cervix cancer cases from 70% to 27% with sufficient state support (46).

PROSTATE CANCER

Prostate cancer is quite common and the proportion is expected to rise with earlier detection of aggressive tumors, changes in population structure and improved registration. The etiology remains to be obscure. Screening with the prostate-specific antigen (PSA) had led to coincident increases in incidence. PSA screening may also partly account for the decreased mortality observed in some populations (1). The European Randomized Study of Screening for Prostate Cancer, started in the early 1990s, reported that PSA-based screening reduced the rate of death from prostate cancer by 20% but was associated with a high risk of over-diagnosis (64). Community-wide PSA screening is currently not feasible in the Philippine setting.

Although the association between prostate cancers and lifestyle changes is still not as unequivocal compared with some sites, 1998–2002 ASRs were indeed higher in the more affluent cities, and the lowest ASRs were observed in the rural municipalities of Rizal province (6). It would seem that the practice of testing with PSA among asymptomatic men in Metro Manila and Rizal province is still not widespread and cannot be a factor in the higher ASRs observed in some areas.

THYROID CANCER

Globally, thyroid cancer ASRs among women range between 2 and 5 per 100 000, roughly double those in men. Higher ASRs have been observed in certain populations, particularly among women. Ionizing radiation and a history of benign thyroid disease are currently the most established factors. Majority are well-differentiated carcinomas, and 5-year survival in North America and Europe is around 85% (1).

Inter-area ASRs in 1998–2002 also showed differences between urbanized areas and rural communities in Rizal province, but the reasons remain unclear (6). In spite of a 1995 Law on salt iodization, it was recently reported that 63.4% of cases with nodular goiter in PGH had iodine deficiency. There was a higher trend (55.8%) of malignant thyroid nodules among iodine-deficient cases compared with iodine-sufficient cases (40%) (65).

The 5-year RSRs among Filipino-Americans (91%) and Caucasians (92%) were higher compared with Metro Manila residents (82%). The difference could be due to better access to health care (9). In PGH, histologic distributions were: papillary carcinoma (66–72%), follicular carcinoma (20–29%) and undifferentiated carcinoma (4–5%) (66–67). Overall survival following surgery for well-differentiated carcinoma was reported to be more than 17 years (68).

CONCLUSIONS AND RECOMMENDATIONS

Generalizability of overall ASRs from Metro Manila and Rizal province to the entire country should be done with caution. The ASRs specific to highly urbanized centers, urbanizing areas and rural municipalities may be the best basis for estimations of ASRs of corresponding populations outside of Metro Manila and Rizal province. The tendency for late stage at diagnosis appears to be nationwide.

Although incidence of stomach and oral cavity cancers had declined, the ASRs of cancers of the lung, breast,
colorectum and prostate increased. Part of the increase may be attributed to higher prevalence of unfavorable lifestyles such as smoking, unhealthy diet and lack of physical activity. In spite of the absence of mass HBV vaccination (or at least of high-risk groups) and a working cervix cancer prevention and early detection system, liver cancer and cervix cancer incidence had slightly decreased. Two articles assessed the cancer control efforts in the Philippines. It was reported that ‘ambitious, comprehensive plans’ had been written but have not been well implemented. The devolution, by Law, of health care to local government units had compounded the socioeconomic situation (69,70).

The Philippine Cancer Control Program, started by the DOH in 1988, included primary prevention components with no specifically allocated budgets and activities that overlapped with other NCD units. Moreover, the early detection methods, also unbudgeted, intended to replicate perceived proven methods in developed countries and had not considered their applicability to the varying local settings, particularly with regard to sociocultural realities, costs and the economic capacity of the government. A major change occurred in 2002 when the NCDPC consolidated activities associated with NCDs and focused on smoking, unhealthy diet, physical inactivity and alcohol overconsumption, a crucial priority considering the limited resources. This activity would require tremendous resources and political will to adequately implement in a sustained fashion. Should extra funds become available, HBV vaccination of high-risk populations, such as neonates, would be beneficial. Because of insufficient public funds allocated to health care, both at the national and local government levels, no population-based screening can be recommended at the moment which would compete for the funds required to improve and sustain an effective national healthy lifestyle program.

Although the SEER-based RSRs may be somewhat overestimated (71–72), there is truly much more to be done to improve survival of breast, cervix and colorectal cancers. As more than 80% of the population may not be able to afford treatment for catastrophic illnesses such as cancer (73), financial aid (public or private) will be necessary to encourage earlier diagnosis and treatment of symptomatic cases.

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**Conflict of interest statement**

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