

Chapter 1

Introduction

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Abstract

The dearth of reliable survival statistics from developing countries was very evident until the mid-1990s. This prompted the International Agency for Research on Cancer (IARC) to undertake a project that facilitated hands-on-training and thereby transfer of knowledge and technology on cancer survival analysis to a majority of researchers from the participating population-based cancer registries, which culminated in the publication of the first volume of the IARC scientific publication on Cancer Survival in Developing Countries in 1998. The present study is the second in the series with wider geographical coverage and is based on data from 27 registries in 14 countries in Africa, Asia, the Caribbean and Central America. The calendar period of registration of incident cases for the present study ranges between 1990 and 2001. Data on 564 606 cases of 1–56 cancer sites from different registries are reported. Data from eleven registries were utilized for eliciting survival trend and seventeen registries for reporting survival by clinical extent of disease. Besides chapters on every registry and general chapters on methodology, database and overview, the availability of online comparative statistics on cancer survival data by participating registries or cancer site in the form of tables or graphs is an added feature (available online at <http://survcan.iarc.fr>).

Reliable data on the magnitude of the cancer problem are essential for monitoring the health of the community, assessing the performance of the health care system and allowing authorities to make informed decisions. The International Agency for Research on Cancer (IARC) has been collating data on cancer incidence and mortality worldwide, including from developing countries, for five decades now [1]. This is complemented by collaborative survival studies that are systematically analysed involving cancer patients in Europe [2], the United States of America [3] and other developed countries [4,5].

The dearth of reliable survival statistics from developing countries was very evident until the mid-1990s. Until then, a few isolated reports on survival using standard methods and based on the hospital-based series of selected cancer cases were available [6,7,8,9]. However, there were no population-based incident cancer case series from population-based cancer registries, which include all the cases diagnosed in a given population. The population-based cancer survival estimates are unbiased by selection, as they reflect the mixture of different socio-economic factors, health care seeking behaviours, natural histories, and the efficiency of the health care services in responding to the needs of early diagnosis, prompt treatment and follow-up care. Population-based survival represents the average prognosis of a given cancer in a given setting

and is a very useful summary measure to evaluate progress in cancer control and to advocate for improved and equitable cancer care. Hence, several interested researchers from the well-laid network of population-based cancer registries in the developing countries with cooperation from all quarters, realized the urgent need of a comprehensive study on cancer survival.

This prompted the start of the collaborative survival project along these lines at the IARC in Lyon, France in 1994. The uniqueness of this study was that all the data submitted were subjected to central scrutiny and analysis, based on established and evolved norms, in a uniform manner. Furthermore, this project facilitated hands-on-training and thereby transfer of knowledge and technology on cancer survival analysis to a majority of researchers from the participating registries, which equipped the institutions with the required expertise to conduct such studies independently in future. All of these culminated in the publication of the first volume of the IARC scientific publication on Cancer Survival in Developing Countries in 1998 [10]. The major outcome of this study was that reliable cancer survival statistics from the developing countries were made available for the first time for comparison with the developed countries. Apart from that, the single most positive thing to happen was the overwhelming response it generated among other researchers, with

more registries showing their willingness to take part in such collaborative survival studies. This led to the conception of the present study with the aim of increased coverage, utilisation of the recent methods in the estimation of survival, analysis of survival trend and wider implications aided by central data scrutiny and analysis at IARC.

Table 1 gives the coverage of the previous volume of Cancer Survival in Developing Countries and the present scientific publication in terms of geography, cancer sites/types reported and cases included for study for every country and registry that participated. **Table 2** summarizes the coverage of all participating registries in terms of cases and analysis. The contributing registries present are mapped in **Figure 1**. The geographic coverage is seen to have a wider representation in the present volume with the inclusion of the continent of Africa joining Asia, the Caribbean and Central America as data providers. The total number of participating countries and registries also witnessed a nearly three-fold increase in the present volume: from ten registries in five countries in the first volume to 27 registries in 14 countries in this second volume. Nine out of ten registries that contributed data to the first volume continued to do so for the second volume. The other eighteen registries are new entrants to the scientific publication series on cancer survival.

The calendar period of registration of incident cases for the present study ranges from 1990 to 2001. It ranged between 1982 and 1992 in the earlier study. Thus, the most needed continuity in calendar time for the comparison of observations from the two studies and their meaningful interpretations has been preserved. Furthermore, six of the nine registries, which provided data for both volumes, have reported cases without discontinuity in calendar period.

The number of cancer sites or types for which the data on survival has been reported in the present study has also seen a substantial increase from the previous one. Three of ten registries had reported data for 20 or more cancers in the previous volume, while the corresponding figures in this volume are 14 of 27. All registries except two that contributed data for both volumes have reported either the same number or increased the number of cancers. The number of cancers reported in the present study ranges from a solitary cancer site to 56.

The increase in the number of registries and cancer sites or types in the present study has resulted in a significant increase in the number of cases reported. It ranges between a low of 300 and a high of >110 000. The corresponding figures were <300 and >65 000 in the previous volume.

The total cases submitted for central scrutiny at IARC for this study exceeded 630 000 cases, compared to about 169 000 in the previous volume, a 4-fold increase. The main analysis involved the cohort of cases from the latest calendar period and comprised the ascertainment of data quality, absolute and relative survival up to 5 years for all ages together, for both sexes and for classified age-groups. The trend analysis focussed on observations of the current period compared to the immediate preceding one. In selected instances, wherein data on incidence and follow-up was available for a very long period, as well as for recent years, the trend was analysed using the novel period approach of estimating survival and compared with the traditional cohort approach. The ratio of the number of cases included in this volume compared to the previous one was 4:1 for the main analysis; additional cases used was 9:1 for the trend analysis. Eleven registries contributed data for the trend analysis and there were seventeen for estimating survival by clinical extent of disease in this study; the corresponding figures for the previous study were one and eight respectively.

Chapter 2 deals with the statistical methods for cancer survival analysis discussing the basic entities, methods utilized in the estimation of absolute and relative survival and the most recent approach of age standardization.

Chapter 3 deals with loss-adjusted methods for estimating survival in the presence of substantial loss to follow-up with empirical examples.

Chapter 4 is the database chapter, giving details of the variables submitted for scrutiny, validation checks, data quality indices and types of analysis performed as a lead to the subsequent chapters on individual registries.

The subsequent chapters are dedicated to the observations on individual registries, with a concise write-up and standard sets of tables.

The final chapter gives an overview of cancer survival in participating countries, deals with discussion on the observed inter- and intra-country differences and the implications of the findings for cancer control, and makes a case for investing in the improvement of cancer health care services in low- and medium-resource countries.

Online dynamic functions are available at <http://survcan.iarc.fr>, to generate tables and figures giving comparative statistics by registry and by cancer site.

Table 1. Coverage of the previous and present volumes by country/registry/geographical area, number of cancer sites/types and cases

	Volume I			Volume II		
	Calendar period of registration	No. of cancer sites	No. of cases included	Calendar period of registration	No. of cancer sites	No. of cases included
CHINA				1991–2001	33–52	270 468
Hong Kong SAR				1996–2001	45	110 190
Qidong ⁺	1982–1991	16	16 922	1992–2000	33	20 167
Shanghai ⁺	1988–1991	39	66 449	1992–1995	52	70 006
Tianjin ⁺				1991–1999	51	70 005
COSTA RICA[§]				1995–2000	2	6297
CUBA⁺	1988–1989	17	12 796	1994–1995	13	8150
THE GAMBIA*				1993–1997	6	505
INDIA				1990–2000	15–28	73 432
Bangalore	1982–1989	8	4781			
Barshi ⁺	1988–1992	1	247	1993–2000	15	1188
Bhopal				1991–1995	16	1863
Chennai ⁺	1984–1989	18	11 246	1990–1999	20	22 618
Karunagappally				1991–1997	22	1601
Mumbai ⁺	1882–1986	2	5226	1992–1999	28	46 162
PAKISTAN						
South Karachi				1995–1999	4	677
PHILIPPINES				1994–1997	1–4	2339
Manila [*]				1994–1995	4	1040
Rizal ⁺	1987	12	1400	1996–1997	1	1299
REPUBLIC OF KOREA				1993–2001	42–56	139 824
Busan				1996–2001	48	41 434
Incheon				1997–2001	42	20 563
Seoul				1993–1997	56	77 827
SAUDI ARABIA						
Riyadh				1994–1996	1	298
SINGAPORE⁺				1993–1997	45	27 016
THAILAND				1990–2000	13–40	27 313
Chiang Mai ⁺	1983–1992	39	14 582	1993–1997	36	7276
Khon Kaen ⁺	1985–1992	35	10 338	1993–1997	13	2253
Lampang				1990–2000	40	11 195
Songkhla				1990–1999	36	6589
TURKEY						
Izmir				1995–1997	12	4381
UGANDA						
Kampala [*]				1993–1997	15	1916
ZIMBABWE						
Harare [*]				1993–1997	17	1990

⁺ Data on previous calendar periods used for trend analysis;

[§] Includes in-situ cancers of the cervix analysed separately;

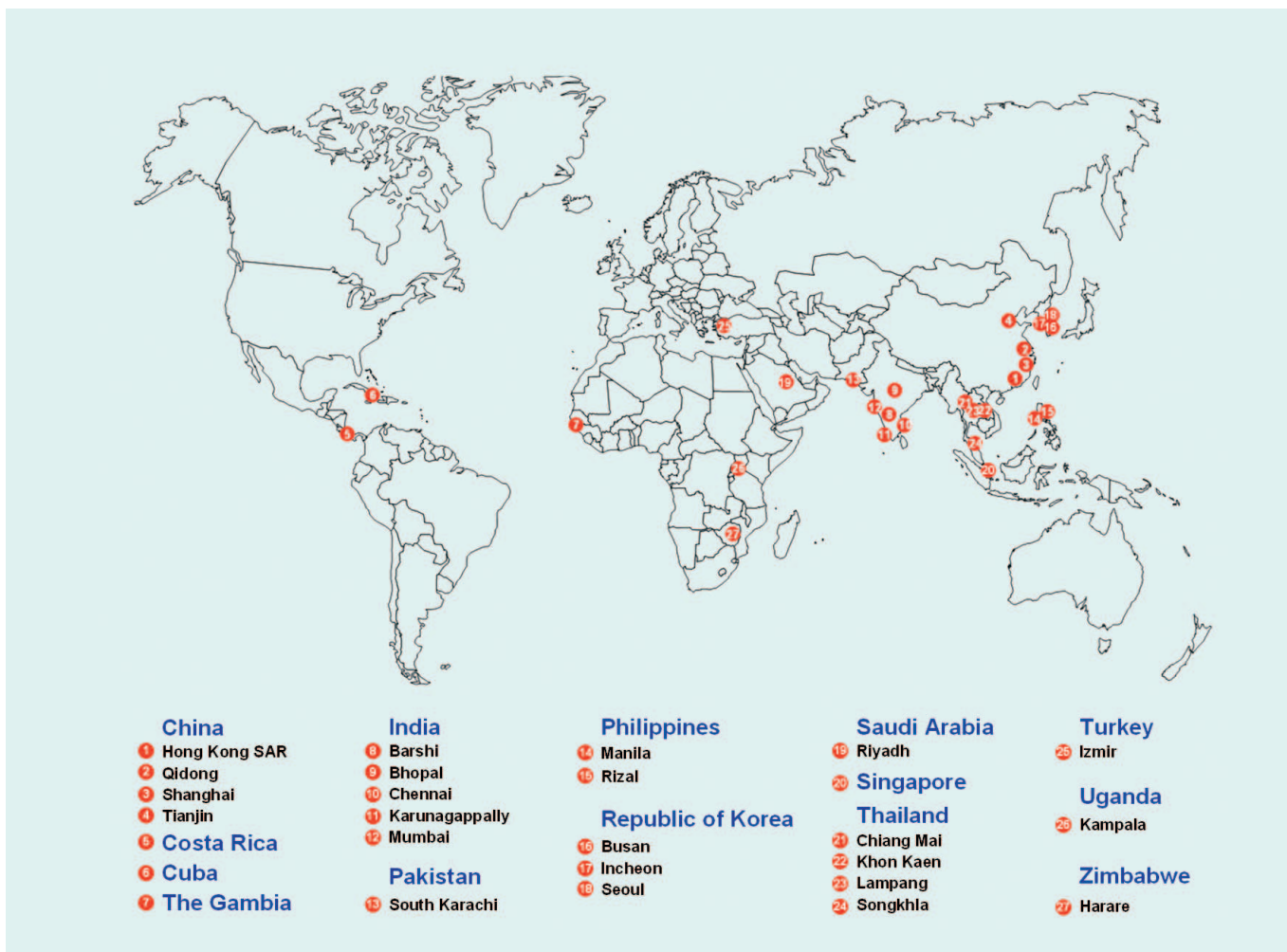
* Random sample of cases for selected sites.

Table 2. Summary of coverage in the two volumes: cases and analysis (*all registries together*)

	Volume I Cancer survival in developing countries	Volume II Cancer survival in Africa, Asia, the Caribbean and Central America
Total cases submitted for scrutiny among included registries (<i>all sites</i>)	168 869	632 361
Number of cases reported (selected sites and with at least 25 cases)		
Registered cases	144 268	610 938
Included for main analysis	143 987	564 606
Additional for trend analysis	18 171	168 181
No. of countries providing data	5	14
Number of registries included		
Main analysis	10	27
Trend analysis	1	11
Survival by clinical extent of disease	8	17
Calendar period of case registration*		
Main analysis	1982–1992	1990–2001
Trend analysis	1972–1991	1968–2000

* Period varies for individual registries

Figure 1. Notional world map showing study locations



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