4.3 Data sources for monitoring global trends in tobacco use behaviours

Introduction

The purpose of this section is to describe the data collection efforts for global surveillance on tobacco use in youth and adults. We include only those surveillance systems that are cross-national and on-going. The youth surveys are school-based with a target survey population of students between 11 and 15 years of age, the primary age of smoking initiation in many countries. The surveillance systems described in this section include: The European School Survey Project on Alcohol and Other Drugs (ESPAD) (ESPAD, 2007), the Global School-Based Student Health Survey (GSHS) (GSHS, 2007), the Global Youth Tobacco Survey (GYTS) (GYTS, 2007), and the Health Behavior in School-Aged Children Survey (HBSC) (HBSC, 2007). The adult surveys have been population-based and target a wider age range (in most cases aged 15-64 or age 18+) than the youth surveys. The adult surveillance systems described include: the Global Adult Tobacco Survey (GATS) (GATS, 2007), the International Tobacco Control Survey (ITC) (ITC, 2007), and the STEPwise Approach to Chronic Disease Factor Surveillance (STEPS) (STEPS, 2007). A description of these youth and adult surveillance systems will be provided in regards to purpose, methodology, survey instrument, survey administration procedures, data analyses, dissemination of information, and utility in monitoring and evaluating articles from the WHO FCTC (WHO, 2003).

Youth

Purpose

European School Survey Project on Alcohol and Other Drugs (ESPAD):

The Pompidou Group is a multi-disciplinary cooperation forum to prevent drug abuse and illicit trafficking in drugs, set up in 1971 and incorporated into the Council of Europe in 1980. At that time, the group recognized the need for countries to collect data on alcohol, tobacco, and other drug use as it relates to public health policy and programmes (ESPAD, 2007). Three points were apparent:

1) Systematic information is generally best gathered through surveys
2) Large-scale, on-going surveys have been conducted, but only in a few countries and not as part of a cross-nationally coordinated system
3) Previous surveys had different methodologies and content, so cross-country comparisons were not possible.

To address these data gaps, the Pompidou Group developed a standard questionnaire for school-based surveys which was pilot tested in eight European countries. Further work was not done until the early 1990s, when the Swedish Government convened a meeting of 21 European countries to build on the work of the Pompidou Group by developing a system for simultaneously collecting school-based data using a common methodology. This resulted in the development of the ESPAD project which has now completed four cycles of data collection: 1995, 1999, 2003, and 2007. Future expansion will occur on a four year cycle. The countries that have participated in ESPAD are shown in Table 4.5.

The goal of ESPAD is to collect cross-nationally comparable data on alcohol, tobacco, and other drug use among students in European countries, and monitor the trends in alcohol and drug use. This is very important as it relates to the European Union (EU) action plan on drugs (EPHA, 2007) and the WHO Europe declaration about young people and alcohol (WHO, 2007b).

1995	1999	2003	2007
Croatia	Croatia	Croatia	Croatia
Cyprus	Cyprus	Cyprus	Cyprus
Czech Republic	Czech Republic	Czech Republic	Czech Republic
Denmark	Denmark	Denmark	Denmark
Estonia	Estonia	Estonia	Estonia
Faroe Islands	Faroe Islands	Faroe Islands	Faroe Islands
Finland	Finland	Finland	Finland
Hungary	Hungary	Hungary	Hungary
Iceland	Iceland	Iceland	Iceland
Italy	Italy	Italy	Italy
Latvia	Latvia	Latvia	Latvia
Lithuania	Lithuania	Lithuania	Lithuania
Malta	Malta	Malta	Malta
Norway	Norway	Norway	Norway
Poland	Poland	Poland	Poland
Portugal	Portugal	Portugal	Portugal
Slovakia	Slovakia	Slovakia	Slovakia
Slovenia	Slovenia	Slovenia	Slovenia
Sweden	Sweden	Sweden	Sweden
Turkey	Ukraine	Turkey	Turkey
Ukraine	United Kingdom	Ukraine	Ukraine
United Kingdom	Greece	United Kingdom	United Kingdom
	Greenland	Greece	Greece
	Bulgaria	Greenland	Greenland
	France	Bulgaria	Bulgaria
	FYR Macedonia	France	France
	Netherlands	Netherlands	FYR Macedonia
	Romania	Romania	Netherlands
	Russian Federation	Russian Federation	Romania
		Austria	Russian Federation
		Belgium	Austria
		Isle of Man	Belgium
		Germany	Isle of Man
		Switzerland	Germany
			Switzerland
			Serbia
			Monaco
			Armenia
			Bosnia & Herzegovina

Table 4.5 Countries Participating in the European School Survey Project on Alcohol and Other Drugs (ESPAD) by Year of Completion

Global School-Based Student Health Survey (GSHS):

The GSHS was developed by WHO (Health Promotion Division) in collaboration with UNAIDS, UNESCO, and UNICEF, and with technical assistance from the United States Centers for Disease Control and Prevention (CDC), Division of Adolescent and School Health in 2001. A school-based survey, GSHS is designed to help countries assess behavioural risk and protective factors among students aged 13-15 years. GSHS data can be used by countries to develop priorities, establish programmes, and advocate for resources for school and youth health programmes and policies. It also can be used by international agencies, countries, and others to make comparisons across countries regarding the prevalence of health behaviours and protective factors and to analyze trends in the behaviours. Implementation of GSHS started in 2003; by the end of 2006, 23 countries had completed a GSHS (Table 4.6).

Global Youth Tobacco Survey (GYTS):

In 1998, WHO and the CDC convened a meeting in Geneva to address the issue of data needs on tobacco use among youth across all Member States of WHO. Three summary points were made at this meeting:

1) Research from developed countries has found that the majority of smokers begin using tobacco products well before the age of 18 years (Perry *et al.*, 1994; Kessler, 1995)
2) Little information exists on tobacco use among youth in developing countries
3) To bridge this data gap and to promote tobacco control for all WHO Member States, WHO's Tobacco Free Initiative (TFI) and CDC's Office on Smoking and Health (OSH) agreed to support the development of the GYTS (GTSS Collaborating Group, 2005).

Implementation of GYTS started in 1999 with 12 countries (Table 4.7). By the end of 2006, 150 countries had conducted the GYTS, and over 50 countries had repeated the survey at least one time. In 2007, 11 countries conducted GYTS for the first time, 46 completed a second round, and 8 a third round.

Health Behavior of School-aged Children Survey (HBSC):

In 1982, the HBSC was initiated by researchers from England, France, and Norway. The purpose of HBSC is to collect data on young people's health and well-being, health behaviours, and the social context in which youth live. Data from HBSC have been used to influence health promotion and education policy at national and international levels. In the mid-1980s, HBSC was adopted by the WHO European Regional Office as a WHO collaborative study. HBSC was developed by a multi-disciplinary network of researchers from countries in Europe and North America. It was first conducted in 1983/84 (5 countries), then in 1985/86 (13 countries), and then every four years: 1989/90 (16

2003	2004	2005	2006	2007
China	Chile	Botswana	Egypt	Cayman Islands
Kenya	Guyana	Lebanon	Guatemala	Djibouti
Philippines	Jordan	Oman	Morocco	**Philippines**
Swaziland	Namibia	Senegal	Tanzania	India
Uganda	Zambia	Tajikistan	Uruguay	Libya
Venezuela		United Arab Emirates		Peru
Zimbabwe				St Lucia
				St Vincent & Grenadines

Table 4.6 Countries Participating in the Global School-Based Student Health Survey (GSHS) by Year of Completion

1999	2000	2001	2002	2003	2004	2005	2006	2007
Barbados	Antigua & Barbuda	American Virgin Islands	Bahrain	Argentina	Afghanistan	American Samoa	Algeria	Bangladesh
China	Argentina	British Virgin Islands	Barbados	Belize	Albania	Cyprus	Angola	Barbados
Costa Rica	Bahamas	Burkina Faso	Botswana	Benin	American Virgin Islands	Egypt	Burkina Faso	Bosnia & Herzegovina
Fiji	Bolivia	Colombia	Brazil	Bolivia	Antigua & Barbuda	Fiji	Czech Republic	Botswana
Jordan	Chile	Cuba	Bulgaria	Bosnia & Herzegovina	Armenia	Gaza Strip/ West Bank	DRC*	Brazil
Poland	Dominica	Ecuador	Costa Rica	Cambodia	Bahamas	Ghana	Eritrea	Bulgaria
Russian Federation	Ghana	Egypt	Czech Republic	Chile	Bangladesh	Haiti	Guatemala	Cambodia
South Africa	Grenada	Gaza Strip/ West Bank	Guam	Cook Islands	Belarus	Iraq	India	Colombia
Sri Lanka	Guyana	Haiti	Guatemala	Cote d'Ivoire	Bhutan	Kuwait	Indonesia	Cook Islands
Ukraine	India	Kenya	Latvia	Croatia	Cuba	Lebanon	Jamaica	Costa Rica
Venezuela	Indonesia	Kuwait	Lesotho	Djibouti	Dominica	Lithuania	Micronesia	Croatia
Zimbabwe	Jamaica	Lebanon	Mozambique	El Salvador	Dominican Rep	Macao	Morocco	Djibouti
	Mariana Islands	Lithuania	Oman	Estonia	Greece	Malawi	New Zealand	Ecuador
	Mexico	Macao	Panama	Ethiopia	Grenada	Mauritania	PNG*	Estonia
	Micronesia	Malawi	Senegal	FYR Macedonia	Guyana	Niger	Samoa	FYR Macedonia
	Montserrat	Mali	Seychelles	Georgia	Kazakhstan	Palau	Taiwan, China	Georgia
	Palau	Mauritania	South Africa	Honduras	Kosovo	Sudan	Timor-Leste	Hungary
	Peru	Morocco	St Kitts & Nevis	Hungary	Kyrgyzstan	Swaziland	Tuvalu	Iran
	Philippines	Myanmar	Syria	Iran	Malaysia	Thailand	Uruguay	Jordan
	Singapore	Nepal	Togo	Jordan	Moldova	Ukraine	USA	Kenya
	Suriname	Niger	Uganda	Laos	Montenegro	United Arab Emirates	Vanuatu	Laos
	Trinidad & Tobago	Nigeria	United Arab Emirates	Libya	Namibia			Latvia
	USA	Saudi Arabia	USA	Maldives	Philippines			Lesotho
		St Lucia	Zambia	Mariana Islands	Puerto Rico			Libya
		St Vincent & Grenadines		Mauritius	Qatar			Maldives
		Sudan		Mongolia	Rep of Korea			Mali
		Swaziland		Nicaragua	Romania			Mexico
		Tunisia		Pakistan	Russian Federation			Mongolia
		Uruguay		Paraguay	Somalia			Mozambique
				Peru	Suriname			Myanmar

Table 4.7 Countries Participating in the Global Youth Tobacco Survey (GYTS) by Year Survey Was Completed

1999	2000	2001	2002	2003	2004	2005	2006	2007
				Poland Serbia Slovakia Slovenia Sri Lanka Tanzania Turkey Venezuela Viet Nam Yemen Zimbabwe	Taiwan, China Tajikistan USA			Nepal Oman Panama Peru Philippines Qatar Saudi Arabia Senegal Serbia Seychelles Slovakia Slovenia Somalia South Africa Sri Lanka St Kitts & Nevis St Lucia St Vincent & Grenadines Syria Togo Trinidad & Tobago Tunisia Turkey Uganda Venezuela Viet Nam Yemen Zambia Zimbabwe

Table 4.7 Countries Participating in the Global Youth Tobacco Survey (GYTS) by Year Survey Was Completed

*DRC = Democratic Republic of the Congo; PNG = Papua New Guinea

1983/84	1985/86	1989/90	1993/94	1997/98	2001/02	2005/06
Austria	Austria	Austria	Austria	Austria	Austria	Austria
Denmark*	Denmark*	Denmark*	Denmark	Denmark	Denmark	Denmark
England	Finland	Finland	Finland	England	England	England
Finland	Norway	Norway	Norway	Finland	Finland	Finland
Norway	Belgium	Belgium	Belgium	Norway	Norway	Norway
	Hungary	Hungary	Hungary	Belgium	Belgium	Belgium
	Israel	Scotland	Israel	Hungary	Hungary	Hungary
	Scotland	Spain	Scotland	Israel	Israel	Israel
	Spain	Sweden	Spain	Scotland	Scotland	Scotland
	Sweden	Switzerland	Sweden	Spain	Spain	Spain
	Switzerland	Wales	Switzerland	Sweden	Sweden	Sweden
	Wales	Netherlands*	Wales	Switzerland	Switzerland	Switzerland
	Netherlands*	Canada	Netherlands	Wales	Wales	Wales
		Latvia	Canada		Netherlands	Netherlands
		N Ireland	Latvia	Canada	Canada	Canada
		Poland	N Ireland	Latvia	Latvia	Latvia
			Poland	N Ireland	N Ireland	N Ireland
			Czech Rep	Poland	Poland	Poland
			Estonia	Czech Republic	Czech Republic	Czech Republic
			France	Estonia	Estonia	Estonia
			Germany	France	France	France
			Greenland	Germany	Germany	Germany
			Lithuania	Greenland	Greenland	Greenland
			Russia	Lithuania	Lithuania	Lithuania
			Slovakia	Russia	Russia	Russia
				Slovakia	Slovakia	Slovakia
				Greece	Greece	Greece
				Portugal	Portugal	Portugal
				Rep of Ireland	Rep of Ireland	Rep of Ireland
				USA	USA	USA
					FYR Macedonia	FYR Macedonia
					Italy	Italy
					Croatia	Croatia
					Malta	Malta
					Slovenia	Slovenia
					Ukraine	Ukraine
						Iceland
						Luxembourg
						Romania
						Turkey

Table 4.8 Countries Participating in the Health Behaviour in School-Aged Survey (HBSC) by Year of Completion

*Survey conducted after schedule

countries), 1993/94 (25 countries), 1997/98 (29 countries), 2001/02 (36 countries), and 2005/06 (40 countries) (Table 4.8; http:// www.hbsc.org/countries.html).

Methodology

European School Survey Project on Alcohol and Other Drugs (ESPAD):

The ESPAD is a school-based survey with the target population being students who are, or will be, 16 years old during the year the data are collected. ESPAD follows a cluster sample design to produce nationally representative data; but the sampling can be either total population sampling, simple cluster sampling, two-stage cluster sampling, or stratified cluster sampling. A minimum of 2400 completed interviews are recommended by ESPAD. If students aged 15-16 are in two or more grades, the survey protocol recommends that all these grades should be included in the sampling frame.

Global School-Based Student Health Survey (GSHS):

A school-based survey, GSHS is conducted primarily among students aged 13-15 years. It uses the same methodology as GYTS (discussed below in the GYTS methodology section). In 11 countries, GYTS and GSHS are currently being conducted simultaneously, sharing sampled schools, but different classes are randomly selected for each survey.

Global Youth Tobacco Survey (GYTS):

The GYTS is a school-based survey of a defined geographic area that can be a country, a province, a city, or any other geographic entity (Centers for Disease Control and Prevention, 2001). Samples are selected as follows:

- The country research coordinator identifies the grades that correspond to students aged 13-15 years in the educational system.
- The research coordinator prepares a database of schools that include the identified grades. Each school is assigned a unique identifier to facilitate school selection. The number of students enrolled in each school grade to be surveyed is added to the database, which forms the survey sampling frame. The amount of work involved in creating this database varies from country to country. In some countries, the creation of the sampling frame has been the most time consuming part of the GYTS.
- The database is sent to the CDC, where the GYTS sample is drawn using a two-stage cluster sample design. Schools are selected with probability proportional to school enrolment size during the first stage, and then classes within participating schools are selected as a systematic equal probability sample with a random start during the second stage. All students in the selected classes are eligible to participate in the survey. For this two-stage sample design, statistical analysis conducted by the CDC (Centers for Disease Control and Prevention, 1999b) has found that, for most sample designs, a minimum of 1500 completed student interviews is needed to obtain a precision level of ± 5% for a given estimate. WHO and CDC use this information to work with the countries to determine the sample size of schools and students needed for each site. The desired sample size is then adjusted for anticipated non-response at the school, class, and student levels. Sample size is further increased if regional or population subgroup estimates are requested within the country.

Since classes are carefully identified to correspond to students 13-15 years old, the majority of selected students are in this age group. However, all students in the selected classes are eligible to participate regardless of age; therefore, some students were younger than 13 years or older than 15 years.

Health Behavior in School-Aged Children Survey (HBSC):

The HBSC is a school-based survey with the target population of students 11, 13, and 15 years old. The desired mean age for the three age groups is 11.5, 13.5, and 15.5 respectively. In some countries, each age group can be found in the same school year, while in others they may be found across years with a proportion of

students being advanced or held back. Cluster sampling is used where the primary sampling unit is school class. The survey is carried out as a nationally representative sample in each participating country. The recommended sample size for each of the three age groups is set at approximately 1500 students. This target population assumes a 95% confidence interval of ± 3% around a proportion of 50% and a design effect of 1.2, based on analysis of existing HBSC data.

Given differences in school systems, age at admission, and the degree of advancement and holding back among students, imposing a uniform approach is problematic in the HBSC. To overcome this complexity, age has been a priority for sampling, with students of the relevant age selected across school years. This position can be further complicated when the target population is split across different levels of schooling, such as primary and secondary. Where the number of classes eligible for sampling is unknown, probability proportionate to size sampling is used, making use of actual or estimated school size. In some countries, to minimize the number of participating schools, classes for one age group were randomly sampled in schools, and then classes drawn from other grades in the same schools. In order to produce mean ages of 11.5, 13.5, and 15.5, the survey is administered at appropriate times of the year.

Survey Instrument

European School Survey Project on Alcohol and Other Drugs (ESPAD):

Questions on alcohol, tobacco, and drugs are included in the ESPAD. There are core questions that all countries are encouraged to include, as well as optional and module questions that may be added. Countries are encouraged to field-test their questionnaire. The final version of the questionnaire is translated into each language needed within country then back-translated into English as a quality control check. The research protocol specifies that questionnaires should be administered anonymously.

Tobacco-related questions in ESPAD include: lifetime cigarette use, use of cigarettes in the last 30 days (i.e. current cigarette smoking), age of initiation of cigarette smoking, number of friends who smoke cigarettes, and number of siblings who smoke.

Global School-Based Student Health Survey (GSHS):

The GSHS includes questions on alcohol, and other drug use; dietary behaviours; hygiene; mental health; physical activity; protective factors; respondent demographics; sexual behaviour; tobacco use; and violence and unintentional injury. Each country develops their questionnaire, which can include core modules, core-expanded questions, and country-specific questions. The final questionnaire is self-administered in classes during one regular class period. The questions are translated into the appropriate language of instruction for the students and pilot tested for comprehension. All questions share common characteristics to enhance the flow of the survey and comprehension by the student.

Core GSHS questions on tobacco use include: age of initiation, cigarette smoking during the past 30 days (i.e. current cigarette smoking), use of other tobacco products during the past 30 days, attempts to stop smoking during the past 12 months, exposure to secondhand smoke during the past 7 days, and use of tobacco by parents or guardians.

Global Youth Tobacco Survey (GYTS):

The GYTS questionnaire is a self-administered, school-based instrument consisting of a core set of questions that are used by all countries, unless the information is not relevant in that country (e.g. pro-cigarette advertising is not permitted in Singapore, so these questions are omitted). In addition, there is an optional set of questions from which a country can draw depending on its needs and priorities. Specific guidelines are followed for questionnaire translation into local languages and pilot testing. The final questionnaire is the responsibility of each participating country.

The 2007 core GYTS questionnaire consists of 54 questions, and includes items on the following topics: prevalence of tobacco use, age of initiation,

exposure to tobacco advertising, perceptions and attitudes on behavioural norms with regard to tobacco use among young people, media and advertising, school curriculum, and secondhand smoke exposure. The GYTS core questionnaire includes information that can be used to monitor seven Articles of the WHO FCTC (Articles 8, 12, 13, 14, 16, 20, and 21) (WHO, 2003).

Health Behavior in School-Aged Children Survey (HBSC):

The HBSC questionnaire consists of a mandatory set of items that each country is required to include: health and well-being, tobacco smoking, alcohol use, cannabis use, physical activity, sedentary behaviour, eating habits, body image, weight control, body weight, oral health, bulling, physical fighting and victimization, and injuries. Countries can also include items specific to their national needs. The final questionnaire includes items on health and health-related behaviours and the life circumstances of young people.

HBSC questions on tobacco use include: lifetime tobacco use, current tobacco smoking, rate of consumption of cigarettes, and age of initiation of daily smoking

Survey administration procedures

European School Survey Project on Alcohol and Other Drugs (ESPAD):

The ESPAD recommends data collection during March/April, and the research protocol states that the survey should be conducted during a week that does not proceed a holiday. Schools that cannot perform the survey during an assigned week are encouraged to use the following week. When possible, the survey should be conducted at the same time in all classes in a school; thus, avoiding the possibility of discussion among students in the school. Each ESPAD researcher decides who to use for survey administration (i.e. teachers, research assistants). ESPAD provides the survey administrator with written instructions on how to conduct the data collection in a class.

Global School-Based Student Health Survey (GSHS):

A survey coordinator in each country manages the GSHS. The coordinator is responsible for the overall management of the project, and functions as a liaison with other agencies and organisations in the country, as well as with WHO and CDC. Survey coordinators are trained during regional workshops on the specific procedures to follow for data collection and data management.

Global Youth Tobacco Survey (GYTS):

As with GSHS, the GYTS is managed by a survey coordinator in each country. Regional training workshops are held each year to train the coordinators on data collection and data management procedures. The intent is to standardize the data collection and management procedures across the countries and within each country across time. A GYTS research manual was developed, which includes detailed procedures for administering the GYTS in schools. The manual is modified for each subsequent GYTS training to meet the specific needs of the countries in those trainings. The manual includes information on obtaining school participation, procedures for completing all survey forms, protocol in the classroom, and instructions for returning the completed forms to CDC for data processing. The GYTS uses a generic answer sheet, which allows for a maximum of 99 questions, with eight response categories available per question. There are no open ended questions, skip patterns, or multiple response questions in the GYTS. The completed answer sheets are scanned through an optical reader. Edits for consistency and out-of-range responses are performed for each question. Data quality issues of this type have been rare; consistency failures or out-of-range responses rarely exceed 5% per question.

The GYTS is administered during one class period. GYTS administration procedures were designed to protect students' privacy by assuring that student participation was anonymous and voluntary. Before the survey is administered, each country follows local procedures for obtaining parental permission and institutional review.

Health Behavior in School-Aged Children Survey (HBSC):

In most cases, data collection for HBSC is between October and May. Data collection consists of the delivery of questionnaires to selected schools for teacher administration. In some schools, researchers administer the survey in the classes in an attempt to minimize teacher burden. Once collected, the data are sent to the HBSC Internal Data Bank at the Norwegian Social Science Data Services for cleaning and final country dataset preparation.

Data analysis

Global School-Based Student Health Survey (GSHS) and Global Youth Tobacco Survey (GYTS):

Both GSHS and GYTS data are weighted to adjust for sample selection (school and class levels), non-response (school, class, and student levels), and post-stratification of the sample population relative to the grade and sex distribution in the total population. The weighting factor consists of the inverse of the probability of selection for each school; the inverse of the probability of selection of each classroom; within each selected school, a school level; non-response adjustment calculated by school enrolment size category (small, medium, large); school non-response calculated within each tertile; a class level, non-response adjustment factor calculated for each school; a student level, non-response adjustment factor calculated by class; and a post-stratification adjustment factor calculated by sex and grade. The computer program SUDAAN (http://-www.rti.org/SUDAAN/) is used to compute standard errors, 95% confidence intervals, and weighted prevalence estimates.

Health Behavior in School-Aged Children Survey (HBSC):

HBSC employs a clustered sampling design, where the primary sampling unit is the class (or school) rather than the individual student, as in a simple random sample. Given such a design, the students' responses cannot be assumed to be independent, as students within the same class or school are more likely to be similar to each other than to students in general. Cluster sampling, therefore, results in standard errors that tend to be higher than would be the case if the same size of sample were obtained using a simple random sample. Consequently, standard errors must be calculated using an appropriate method that takes into account the correlation of young people in schools or classes (SUDAAN, STATA (http://www.stata.com/), and EPI INFO (http:// www.cdc.gov/epiinfo/) are statistical packages developed for the analysis of complex survey data). In addition, a number of countries and regions stratify their samples, classifying the sample frame into smaller units (i.e. geographical areas) to ensure coverage of all regions. This stratification is likely to reduce standard errors and should be taken into account when they are being calculated.

Dissemination of Information

Information on the ESPAD can be found at http://www.espad.org. In addition, cross-national reports for study years 1995, 1999 and 2003 are available from the Swedish Council for Information on Alcohol and Other Drugs.

Information on the GSHS can be found at http://www.who.int/chp/gshs/en and http://www.cdc.gov/gshs. Country datasets can be obtained on both websites.

Information on the GYTS can be found at http://www. cdc.gov/tobacco/global. The GYTS website includes Country Fact Sheets, Country GYTS Reports, and access to country datasets. In addition, over 45 articles using GYTS data have been published in peer reviewed journals, such as *Lancet, Tobacco Control, and Morbidity and Mortality Weekly Reports*.

Information on the HBSC can be found at http://www.hbsc.org. Over 160 articles have been published featuring HBSC data, including recent articles in the *European Journal of Public Health, Health Education, and the Journal of Adolescent Health*.

2007	2008
Bangladesh	China
Brazil	Indonesia
Egypt	Mexico
India	Pakistan
Russian Federation	Philippine
Thailand	Poland
	Turkey
	Ukraine
	Viet Nam

Table 4.9 Countries Participating in the Global Adult Tobacco Surveys (GATS) by Year of Survey Completion

Summary

Comparison of youth survey content

All four surveys measure tobacco use prevalence (See Table 4.12 for a full comparison of measures by survey). ESPAD and HBSC ask only about cigarette smoking. GSHS and GYTS ask about cigarette smoking, as well as use of other tobacco products. All four surveys ask about age of initiation of cigarette smoking, however ESPAD, GSHS, and GYTS ask about first use, whereas HBSC asks about initiation of daily smoking.

ESPAD, GSHS, and GYTS ask respondents about secondhand smoke exposure, but use different indicators to assess exposure. ESPAD and GYTS ask about number of friends who smoke and ESPAD asks about number of siblings who smoke. GSHS and GYTS ask about exposure to secondhand smoke at home and in public places during the week prior to the survey, as well as smoking behaviour of parents.

GYTS assesses school curriculum by asking students if they were taught about the dangers of smoking in the year prior to the survey, if they discussed reasons why people their age smoke, and if they were taught about the specific health effects of smoking. The other three surveys do not include items to assess school curriculum components.

GYTS measures exposure to pro-tobacco media messages by asking students if they have seen actors smoking in movies, videos, or on TV; if they saw ads on billboards or in newspapers for tobacco products; and if they have an object with a cigarette brand logo on it. GYTS also asks students if they have seen anti-tobacco media messages. The other three surveys do not include indicators of media exposure to tobacco advertising.

GSHS and GYTS ask students about cessation behaviour. Both surveys ask students if they have tried to quit smoking in the year prior to the survey. GYTS also

2002	2003	2004	2005	2006	2007
Australia	Australia	Australia	Australia	Australia	Australia
Canada	Canada	Canada	Canada	Canada	Canada
United Kingdom	United Kingdom	Ireland	Ireland	China	China
United States	United States	United Kingdom	Malaysia	Ireland	France
		United States	Republic of Korea	Mexico	Germany
			Scotland	Scotland	Ireland
			Thailand	United Kingdom	Malaysia
			United Kingdom	United States	Mexico
			United States	Uruguay	New Zealand
					Scotland
					Thailand
					United Kingdom
					United States

Table 4.10 Countries Participating in the International Tobacco Control Survey (ITC) by Year of Survey Completion

asks students if they received help to quit smoking and from whom, and measures tobacco dependency using a standard indicator of addiction (time to first cigarette). The other two surveys do not include measures of cessation.

GYTS assesses minors' access to tobacco products by asking current smokers where they usually get their cigarettes, if they have been refused purchase of cigarettes when they tried to buy them in a store, and if they have been offered free cigarettes by a tobacco company representative. The other three surveys do not include measures of minors' access to tobacco products.

Limitations of youth survey content

There are several limitations inherent in each of the youth surveys. First, the target populations are young people in school, and by definition, school-based surveys do not attempt to collect information about the portion of the youth population that is out of school. School-based surveys are thus not representative of the entire youth population in any country. The extent to which the information collected by a school-based survey is not representative of the total youth population varies by country. Second, the school-based surveys described in this section conduct anonymous and self-administered interviews giving each student in a selected class one chance to participate. Students who miss class or refuse to participate are not represented in the sample. Third, extensive reliability testing of all the instruments used by the different surveys has not been completed; however, questions on tobacco use in GYTS also appearing in the CDC's Youth Risk Behavioral Survey (YRBS), have been shown to have good test-retest reliability in a study conducted in the USA (Brener *et al*., 1995).

Adults

Purpose

Global Adult Tobacco Survey (GATS);

In 2006, the GATS was initiated with funds from the Bloomberg Foundation to reduce tobacco use in low- and middle-income countries. The initiative places a priority on countries with the greatest number of smokers. More than half of the world's smokers live in fifteen countries: China, India, Indonesia, Russia, Bangladesh, Brazil, Mexico, Turkey, Pakistan, Egypt, Ukraine, Philippines, Thailand, Viet Nam, and Poland (Table 4.9).

In addition to the CDC Foundation, other key partners in the Bloomberg Initiative include the Campaign for Tobacco Free-Kids, the World Lung Foundation, the Johns Hopkins Bloomberg School of Public Health, and the WHO. Partners are charged with working collaboratively to promote international support for tobacco control policies, increase effective advocacy, and implement tobacco-free programming. Specifically, the partner organisations will:

- Refine and optimize tobacco control programmes to help smokers stop and prevent children from starting
- Support public sector efforts to pass and enforce key laws and implement effective policies, in particular, to tax cigarettes, prevent smuggling, change the image of tobacco, and protect workers from exposure to other people's smoke
- Support advocates' efforts to educate communities about the harms of tobacco and to enhance tobacco control activities so as to help make the world tobacco-free
- Develop a rigorous system to monitor the status of global tobacco use.

The CDC Foundation worked with partners around the world, particularly with the WHO, and in high-burden countries, to develop GATS (i.e. establish systematic, standardised global surveillance and monitoring of the tobacco epidemic).

International Tobacco Control Survey (ITC):

The ITC Project began in 2002 as a prospective cohort study tracking and comparing the impact of national-level tobacco policies among representative samples of adult smokers in four countries: the USA, Canada, the United Kingdom, and Australia (Table 4.10). In 2004, ITC was expanded to include smokers from Ireland and a new cohort of smokers from the UK, to evaluate the 2004

2002	2003	2004	2005	2006	2007
Ethiopia	Algeria	American Samoa	Burundi	Aruba	Angola
Fiji	Bangladesh	Cook Islands	Cote d'Ivoire	Iran	Barbados
Oman	Cameroon	Jordan	DRC*	Kuwait	Botswana
Samoa	**India**	Lebanon	DPRK*	Mauritania	Cambodia
	Indonesia	Maldives	Egypt	Mongolia	Cape Verde
	Kenya	Myanmar	Iraq	**Sri Lanka**	China
	Marshall Islands	Nauru	Kiribati	Thailand	Cuba
	Micronesia	Pakistan	Mauritius	Vanuatu	Curacao
	Palau		Mozambique	Zambia	Dominica
	Sri Lanka		Nepal		Dominican Rep
	Syria		Saudi Arabia		Equatorial Guinea
			Solomon Islands		Gaza Strip
			Tokelau		Ghana
			Tuvalu		Grenada
			Zimbabwe		**Kenya**
					India
					Iran
					Laos
					Libya
					Paraguay
					PNG*
					St Kitts & Nevis
					South Africa
					Tanzania
					Trinidad & Tobago
					Togo
					Turks & Caicos
					Uganda
					Uruguay
					Viet Nam
					Zimbabwe

Table 4.11 Countries Participating in the WHO STEPwise Approach to Surveillance (STEPS) by Year of Survey Completion

*DRC = Democratic Republic of the Congo; DPRK = Democratic People's Republic of Korea; PNG = Papua New Guinea

Ireland smoke-free policy. In 2005, the collection of ITC countries was further expanded to include cohorts of smokers in Malaysia, Republic of Korea, Scotland, and Thailand. In 2006, ITC was further expanded to include China, Mexico, and Uruguay; in 2007 France, Germany and New Zealand joined on. The objective of the ITC is to apply rigorous research methods to evaluate the psychosocial and behavioural effects of national level tobacco control policies. The ITC Project uses multiple country controls, longitudinal designs, and theory-driven mediational models that allow tests of hypotheses about the anticipated effects of given policies.

STEPwise Approach to Chronic Disease Factor Surveillance (STEPS):

In 2000, the 53rd World Health Assembly passed a resolution in support of the need to prevent and control non-communicable diseases (NCD). The goal of the resolution was to support WHO Member States in their efforts to reduce morbidity, disability, and premature mortality related to NCDs. Development of a NCD surveillance system was one of the primary objectives of this effort, and WHO STEPwise approach to Surveillance (STEPS) was developed to meet this need. The WHO STEPS is a simple, standardised method for collecting, analyzing, and disseminating data in WHO member countries.

By using the same standardised questions and protocols, all countries can use STEPS information not only for monitoring within-country trends, but also for making comparisons across countries. The approach encourages the collection of small amounts of useful information on a regular and continuing basis.

As a surveillance system, STEPS provides information on NCD risk behaviours that countries can use for better public health policy decision-making. The goal of STEPS is to build the capacity of countries to develop and maintain an integrated, systematic, data collection system that collects data on NCDs and their risk factors, including information on tobacco use (specific tobacco questions included in STEPS are discussed later in the section). There are currently two primary STEPS surveillance systems: the STEPwise approach to risk factor surveillance, and the STEPwise approach to stroke surveillance. The survey is currently being implemented in over 80 countries with new countries coming on board on a regular basis (Table 4.11). STEPS is active in all WHO regions except EURO (where existing surveillance systems are already in place for NCD risk factors). Nearly all AFRO countries have done or plan to do STEPS surveys.

Survey methodology

Global Adult Tobacco Survey (GATS):

The GATS is a household survey of adults aged 15-64 years. The sample domains include complete population coverage, except for areas that have special country circumstances (e.g. conflict areas, remote areas). In addition, institutional populations (e.g. prisons, dormitories, hospitals) are excluded. A multi-stage sampling design was used to include all household members aged 15-64 from a sample of households, with one individual randomly selected per household. Interviews were completed face-to-face. In this survey, a probability sample is required; therefore, an appropriate method of random sampling is used in each sampling stage so that selection probabilities can be determined for all sampling units in each stage, and the probability of selection for each respondent (computed as the product of stage-specific probabilities) is known. Aside from needed oversampling (e.g. by urban/rural and region), random selection was used in each stage in a way that makes selection probabilities among respondents as equal as possible. Substitution or replacement sampling was not allowed in any stage of the sample design. Four stages are included in the sample design: primary sample units (PSU) of the smaller, or the smallest, recognized geopolitical area units with current statistical population (i.e. individual or household); count data and quality cartographic maps (e.g. county, census tract, or block group, rather than state in the USA); secondary sampling units (SSU) of recognized geopolitical subunits to the area units used for PSUs; individual housing/dwelling units (see Census website for definitions of these geographic terms), or small groups (<10) of neighboring housing units (HUs compact segments); and finally, within-household sampling of one study-eligible household resident from a roster of residents 15-64 years of age.

Targeted sample sizes (for both genders combined) for urban and rural respondents should be approximately 4000 each. This can be accomplished by selecting the same number of PSUs in urban and rural strata. These estimates were arrived at by specifying the following parameters in the sample size calculation needed to detect differences in key rates (smoking prevalence) between survey rounds: 95% confidence error margins of ≤ 3 percentage points

for tobacco use estimates of 40% at any given round, 80% power (Type I error of 0.05 and two-sided test alternatives), and a design effect of 2.0 (arising out of the effect of cluster sampling). Samples in each round are independently chosen and should be proportionate for all demographic categories except level of urbanization and region.

International Tobacco Control Survey (ITC):

The ITC Project stratifies the country population into several geographic regions. Quotas were assigned for the number of respondents (age 18 and over) in each of the strata, in order to ensure representation proportional to a measure of regional population size. In the original four countries, eligible households were then selected by random digit dialing methods until the within-stratum quotas were met. As the survey was expanded to countries that had less complete phone coverage, the ITC employed multistage cluster sampling across entire countries (Thailand and Malaysia), or within key geographical areas (Mexico, Uruguay, China), which was implemented with face-to-face interviews. A household was deemed eligible for inclusion in the survey if it contained at least one eligible smoker. In households with multiple eligible smokers, the Next Birthday method was used to select a single respondent. No substitution within the household was permitted, except where it was known that the selected respondent would be absent for the entire fieldwork procedure.

A ten minute recruitment survey was first conducted to screen for eligibility. A thank you letter and financial compensation were mailed immediately after the recruitment calls. In order to avoid call-scheduling bias, recruitment calls were conducted at various times of the day and on different days of the week. If a respondent agreed to participate, but did not keep a main survey appointment, up to 25 attempts to follow-up were made at varying times of day. In addition, respondents could complete the main survey during two or more calls if requested (Thompson *et al.*, 2006).

STEPwise Approach to Chronic Disease Factor Surveillance (STEPS):

The STEPS is an adult survey conducted with a sample of 25-64 year olds (although many countries survey young adults age 15-18) in the household setting (Steps 1 and 2) and in the clinic setting (Step 3). Five different sample designs are supported. In general, the sample is a multi-stage cluster sample of at least 2000 adults.

Prior to survey implementation, STEPS completes preliminary phases including: defining target population, sample size, sampling frame and design, selecting sample participants, and documenting sample selection. Its methodology emphasizes sampling a target population that at a minimum comprises adults aged 25-64; wider age ranges are permissible, but not narrower.

The sampling scheme to be followed will depend on the size of the population, geographic area to be sampled, and available resources. Stratification of the population to be sampled is often done according to physical location of the sampling units (e.g. urban versus rural). Proportional or disproportional allocation of sampling units per strata may be enforced. Simple random sampling or multi-stage cluster sampling are followed, and both can be utilized in conjunction with stratification. STEPS recommends the use of multi-stage cluster sampling when conducting national surveys.

For the actual drawing of the sample, sampling probability proportional to size is used. Once the selection of the household and/or individuals is completed, data collection begins through interviewing. If collection of clinical data is planned, participating clinics are identified and clinical registration, blood collection, and biochemical measurement forms are compiled along with biological samples.

Survey Instrument

Global Adult Tobacco Survey (GATS):

The core GATS questionnaire was developed by an expert committee, including representatives from WHO (regional and country offices), CDC, and international tobacco control experts. The core instrument was tested in cognitive laboratory procedures in March 2007, and was piloted tested in the

Philippines and India in April and May 2007. Results from the cognitive laboratory and pilot studies were used to finalize the core questionnaire at a meeting of the expert committee in June 2007.

The core GATS questionnaire includes indicators on tobacco prevalence (smoking and smokeless tobacco use), exposure to secondhand smoke, cessation, risk perceptions, knowledge and attitudes, exposure to media, and price and taxation issues.

International Tobacco Control Survey (ITC):

The ITC questionnaire was developed by a multidisciplinary team of international tobacco control experts. A pilot survey, including the screener and main survey, was conducted among 125 respondents; the instrument was revised as a result of the pretest. The questionnaire has been revised at each subsequent wave, but the core of the instrument has remained essentially the same to facilitate comparisons and modeling over time. Apart from minor variations in colloquial language, the same questionnaire was used in all four English speaking countries; translations are used in the other countries.

Due to the objectives of ITC and the eligibility requirements of respondents, the questionnaire includes questions on a wide range of tobacco-related behaviours, knowledge, and attitudes that are targeted to current smokers. These indicators include: daily cigarette consumption, weekly cigarette consumption, type of product smoked (hand-rolled or manufactured; menthol, Virginia, or blended; pieces in pack; filtered or non-filtered), cigarette brand preference, duration of smoking (time since respondent started smoking), dependency (time to first smoke), current use of tobacco products other than cigarettes (including cigars, pipes, chewing tobacco, snuff, and other products), number of closest friends who smoke, smoking policy at respondent's place of work, support for smoking regulations in indoor public areas, knowledge of health effects and diseases caused by smoking, beliefs about dangers of different tobacco products, perception of relative danger of tobacco products other than cigarettes, a module of questions regarding warning labels, a module of questions about pro-tobacco advertising, a module of questions about awareness campaigns that shows dangers of smoking or encourages quitting, desire to quit, number of quit attempts, duration of last smoke-free period, knowledge and use of cessation support products, cessation services available (doctor or health professional, telephone quit line, clinics, participation in international events such as Quit and Win Contests), and perceived difficulty to quit smoking.

STEPwise Approach to Chronic Disease Factor Surveillance (STEPS):

The STEPS instrument covers three different levels of "steps" of risk factor assessment through the collection of the following types of data:

- Questionnaire
- Physical measurements
- Biochemical measurements

Step 1 gathers information on risk factors that can be obtained from the general population by questionnaire. This includes information on socio-demographic features, tobacco use, alcohol consumption, physical inactivity, and fruit/vegetable intake. Step 2 includes objective data by simple physical measurements needed to examine risk factors that are physiologic attributes of the human body, such as height, weight, waist circumference (for obesity), and blood pressure. Step 3 carries the objective measurements of physiologic attributes one step further with the inclusion of blood samples for measuring lipid and glucose levels.

The STEPS tobacco questions were drawn from WHO's Guidelines for Controlling and Monitoring the Tobacco Epidemic (WHO, 1998a). Core tobacco use questions include: current smoking of any tobacco products (such as cigarettes, cigars, or pipes); current daily smoking of tobacco products; age of initiation of daily smoking; and daily consumption of tobacco (manufactured cigarettes, hand-rolled cigarettes, pipes full of tobacco, cigars/cheroots/cigaril-los, or other). Expanded tobacco use questions include: ever smoke daily; age when stopped smoking daily; current use of smokeless tobacco, such as snuff, chewing tobacco, betel; current daily use of

smokeless tobacco products; number of times a day use smokeless tobacco products; and ever daily use of smokeless tobacco, such as snuff, chewing tobacco, betel. Currently no data are collected on cessation, secondhand smoke exposure, exposure to pro-tobacco media and advertising, economics, knowledge, and attitudes.

Survey administration procedure

Global Adult Tobacco Survey (GATS):
Survey administration of GATS consists of a coordinated effort between WHO (regional and country offices), CDC, and the country GATS coordinator working in the Ministry of Health. Each country GATS coordinator identifies possible companies or agencies that can carry out the survey. WHO and CDC meet within country with the GATS coordinator to make the final selection, and follow-up on all details with the company chosen, including timeline, budget, training of interviewers, and other tasks as relevant.

GATS interviews are conducted in households by trained interviewers. Survey teams are used, which consist of a supervisor and interviewers. The supervisor has the responsibility of leading the team, identifying the correct geographic location for the selection of the households, assigning interviewers to houses, and conducting quality control checks on each interviewer. The interviewers conduct the interview with the appropriate person in each household and maintain high quality standards.

International Tobacco Control Survey (ITC):
Survey administration for ITC has been handled by contracting companies. Waves 1 and 2 of the survey were conducted in Canada and the USA by Environics Research group. Waves 1 and 2 in Australia and the UK, and all countries that participated in Waves 3 and 4, were conducted by Roy Morgan Research. Senior representatives of the companies participated in the protocol design, in order to ensure standardization of the survey administration and calling protocol across survey sites. All calling specifications, final questionnaires, and daily reports were reviewed and monitored by the ITC Research Team, at the University of Waterloo, to maintain consistency across survey firms and countries.

STEPwise Approach to Chronic Disease Factor Surveillance (STEPS):
WHO conducts Regional STEPS Training Workshops for country STEPS research coordinators. Part 3 in the WHO STEPS Surveillance Manual (available at http://www.who.int/chp/steps/manual/en/index.html) includes a "Training Guide" for how to plan, prepare for, and deliver training to the data collection, data entry, and data analysis teams. STEPS has three separate trainings: interviewer training, data entry training, and data analysis training. Part 4 in the WHO STEPS Surveillance Manual covers details regarding data collection, data entry and data management, and data analysis.

Data analysis

Global Adult Tobacco Survey (GATS):
GATS data are weighted to adjust for sample selection, non-response, and post-stratification of the sample population. Since it uses a multistage sample design, estimates of standard errors must be adjusted to take into account the design effect. Specific statistical analysis products are required that can accommodate the complex weighting considerations. The computer program SUDAAN was used to compute standard errors, 95% confidence intervals, and weighted estimates.

International Tobacco Control Survey (ITC):
The ITC sampling design was chosen to provide a random, unbiased, representative sample of adult smokers within each geographic stratum. In order to adjust for disproportionate selection and under-coverage of population subgroups, weights in Wave 1 were calculated for each respondent to adjust for number of residential phone lines and adult smokers in the household. These weights were adjusted to produce recruitment weights, so that estimates of total numbers of smokers in age-sex groups agreed with current smoking prevalence numbers in the country. The weights were also

adjusted for attrition between the recruitment and the main survey. In subsequent waves, weights were created for longitudinal or cohort analyses for respondents who completed two or more waves. Cross-sectional weights were calculated to incorporate newly recruited respondents

The ITC uses a complex survey design; therefore, standard error estimators need to be adjusted to take into account the design effect. Specific statistical analysis products are required that can accommodate the complex weighting considerations. These packages include SUDAAN, WesVar (http://www.westat.com/wesvar/), STATA, and SAS (http://www.sas.com).

STEPwise Approach to Chronic Disease Factor Surveillance (STEPS):
Part 4, Section 3 of the WHO STEPS Surveillance Manual includes discussion of the tasks that are needed to analyze STEPS data. STEPS recommends the country data analysts work with a survey statistician for advice and support (if none is available then the country coordinator can receive assistance from the STEPS team in Geneva). They also suggest that the country coordinator use EPI INFO (version 3.3 or higher), or other similar statistical software packages, for data analysis. STEPS provides technical support and training for EPI INFO, and training for analysts for data cleaning, weighting, and analysis, upon request. The STEPS sampling workbook contains spreadsheets for calculating weights. STEPS assists the country coordinator in producing a Fact Sheet showing key findings from the survey, which can be used for quick dissemination of the results.

Dissemination of Information

Global Adult Tobacco Survey (GATS):
Dissemination of GATS information is a primary focus of WHO and CDC. A website for easy access to the GATS data, reports, and country Fact Sheets is being developed by WHO (this site should be available by the end of 2008).

International Tobacco Control Survey (ITC):
Publications by ITC researchers, and other authors, featuring the ITC data can be found at http://www.itcproject.org.

STEPwise Approach to Chronic Disease Factor Surveillance (STEPS):
Part 4, Section 4 of the WHO STEPS Surveillance Manual includes information on reporting and disseminating STEPS results. Countries are encouraged to disseminate the results from their survey in a timely manner after survey completion. The results can help:

1) Raise awareness about preventing chronic disease and their risk factors
2) Guide public health policy and interventions to address chronic diseases
3) Assist and inform future health research

STEPS encourages the coordinators to prepare Fact Sheets and Country Reports. The Fact Sheet should be a short summary of the key results and used for immediate dissemination. The Country Report should be comprehensive and include: the overall rationale, scope of the survey, the sampling design, details of the methods for data collection, detailed results of the survey, and implications for future health and planning. It should be widely distributed to relevant government agencies and sponsoring organisations, non-governmental organisations that could use the information, public, government and institutional libraries, press and other media outlets, and websites. Detailed information about STEPS can be found at http://www.who.int/chp/steps/en/.

Summary

Comparison of adult survey content
All three surveys measure tobacco use prevalence and consumption levels of various products (see Table 4.13 for a full comparison of measures in each survey). GATS, ITC, and STEPS ask about cigarette smoking and use of tobacco products other than cigarettes. All four surveys ask about age of initiation of daily cigarette smoking; however, GATS asks about first use of cigarettes for smokers who are not daily smokers.

GATS and ITC query respondents about secondhand smoke exposure, but use different indicators to assess exposure. Both ask about smoking policies in respondents' homes and workplaces. ITC asks about number of closest friends who smoke. GATS has questions about the rules concerning smoking in respondents' homes and if there are other members of the household that smoke.

GATS and ITC assess respondents' knowledge and beliefs about the health effects of smoking. Both surveys include a battery of questions about the relationship between smoking and a variety of diseases and conditions. GATS and ITC ask respondents about their perceptions of the relative danger of tobacco products other than cigarettes.

GATS and ITC include questions about exposure to pro- and antitobacco media messages. Both surveys ask about respondents' exposure to pro-tobacco advertising in a variety of media, such as billboards, point of sale, radio, television, and movies. Respondents' viewing of health warning labels on tobacco packaging is also asked about in both surveys. GATS and ITC also include questions on price and taxation.

GATS and ITC ask respondents about cessation behaviour. Both surveys ask respondents about their motivation to quit smoking; unsuccessful quit attempts; and knowledge of cessation support products, such as nicotine replacement therapies and antidepressants. A measure of tobacco dependency, using a standard indicator of addiction (time to first cigarette) and respondents' perceived difficulty to quit smoking, is applied in both surveys.

ITC includes questions that assess policy-specific mediators and psychosocial mediators of policy impact.

Limitations of adult survey content

There are some limitations of ITC, GATS, and STEPS. The longitudinal design of ITC is intended to evaluate the impact of policies on smokers. The sampling methodology screens households for smokers as the target population, although participating countries have the option of including an additional sample of non-smokers. The ITC samples are designed to be representative of the smoker population of the countries or of major geographic areas within the countries; they are not designed to assess national or regional levels of tobacco prevalence. The primary limitation facing GATS at this time is the question of coverage and sustainability. The Bloomberg Foundation intends to fund future expansion and repetition of GATS, but whether this funding can lead to expansion of GATS to all WHO Member States and include provisions for repeat rounds, is unknown. As a multirisk survey, STEPS has limits on the number of tobacco-related questions that can be included. Further, STEPS is dependent on countries to follow statistically valid protocols for sample design and field procedures. It also has limited quality control measures in place to assure compliance with the protocols.

Discussion

Public health surveillance involves "…the ongoing systematic collection, analysis, and interpretation of outcome specific data for use in planning, implementation, and evaluation of public health practice" (Taylor & Bettcher, 2000). As of March 14, 2007, 145 of the 192 WHO Member States had ratified WHO FCTC. An important feature of the WHO FCTC is the call for countries to establish programmes for national, regional, and global surveillance as stated in Article 20:

Research, surveillance and exchange of information – "The Parties shall establish, as appropriate, programmes for national, regional, and global surveillance of the magnitude, patterns, determinants and consequences of tobacco consumption and exposure to tobacco smoke. Towards this end, the Parties should integrate tobacco surveillance programmes into national, regional, and global health surveillance programmes so that data are comparable and can be analyzed at the regional and international levels, as appropriate" (WHO, 2003).

One of the primary goals of the WHO FCTC is the development, implementation, and evaluation of effective tobacco control pro-

WHO FCTC Article	European School Survey Project on Alcohol and Other Drugs (ESPAD)	Global School Health Survey (GSHS)	Global Youth Tobacc Survey (GYTS)	Health Behaviour of School-aged Children (HBSC)
Article 20: **Research, surveillance and exchange of information.** The Parties shall establish, as appropriate, programmes for national, regional, and global surveillance of the magnitude, patterns, determinants, and consequences of tobacco consumption and exposure to tobacco smoke. Towards this end, the Parties should integrate tobacco surveillance programmes into national, regional, and global health surveillance programmes so that data are comparable and can be analysed at the regional and international levels, as appropriate.	In the early 1990s, the Swedish Government convened a meeting of 21 European countries to build on the work of the Pompidou Group by developing a system for simultaneously collecting school-based data using a common methodology. This resulted in the development of the ESPAD project which has now completed three cycles of data collection: 1995, 1999, and 2003. Future expansion of ESPAD will occur on a four year cycle.	GSHS data can be used by countries to develop priorities, establish programmes, and advocate for resources for school health and youth health programmes and policies. GSHS also can be used by international agencies, countries, and others to make comparisons across countries regarding the prevalence of health behaviours and protective factors and to analyze trends in the behaviours. Implementation of GSHS started in 2003; by the end of 2006, 24 countries had completed a GSHS.	Initiated in 1999, GYTS was developed by WHO Headquarters, WHO Regional Offices, and CDC. By the end of 2006, 150 countries had completed at least one round of GYTS; of these, 44 countries have completed a second round. In 2007, 17 countries conducted the survey for the first time, 31 countries were prepared to conduct a second round, and 42 trained to conduct the survey in the future.	Data from HBSC has been used to influence health promotion and health education policy at national and international levels. In the mid-1980s, HBSC was adopted by the WHO European Regional Office as a WHO collaborative study. HBSC was developed by a multidisciplinary network of researchers from countries in Europe and the United States. HBSC was first conducted in 1983/84 (5 countries), in 1985/86 (13 countries), and then every four years: 1989/90 (16 countries), 1993/94 (26 countries), 1997/98 (29 countries), 2001/02 (36 countries), and 2005/06 (41 countries).
Prevalence Article 21: **Reporting and exchange of information.** Each Party shall submit to the Conference of the Parties, through the Secretariat, periodic reports on its implementation of this Convention, which should include the following: information on surveillance and research as specified in Article 20 (Research, surveillance, and exchange of information)	- Lifetime cigarette use - Use of cigarettes in the last 30 days (i.e. current cigarette smoking) - Age of initiation of cigarette smoking	- Age of initiation - Cigarette smoking during the past 30 days (i.e. current cigarette smoking) - Use of other tobacco products during the past 30 days	- Lifetime cigarette use - Initiated smoking before age 10 - Cigarette smoking during the past 30 days (i.e. current cigarette smoking) - Current use of tobacco other than cigarettes - Never smokers susceptible to initiate smoking in the next year	- Lifetime tobacco smoke - Current tobacco smoking - Consumption of cigarettes - Age of initiation of daily smoking

Table 4.12 European School Survey Project on Alcohol and Other Drugs (ESPAD), Global School-Based Student Health Survey (GSHS), Global Youth Tobacco Survey (GYTS), and Health Behavior of School-Aged Children (HBSC) Measures That Can Be Used to Monitor the WHO Framework Convention for Tobacco Control (FCTC)

WHO FCTC Article	ESPAD	GSHS	GYTS	HBSC
Exposure to Second-hand Smoke Article 8: **Protection from exposure to tobacco smoke.** Each Party shall adopt and implement in areas of existing national jurisdiction, as determined by national law, and actively promote at other jurisdictional levels the adoption and implementation of effective legislative, executive, administrative, and/or other measures, providing for protection from exposure to tobacco smoke in indoor workplaces, public transport, indoor public places, and, as appropriate, other public places.	- Number of friends who smoke cigarettes - Number of siblings who smoke	- Exposure to second-hand smoke during the past 7 days - Use of tobacco by parents or guardians -	- Exposed to smoke from others in their home - Exposed to smoke from others in public places - Think smoking should be banned from public places - Use of tobacco by parents	
School Article 12: **Education, communication, training and public awareness.** Each Party shall promote and strengthen public awareness of tobacco control issues, using all available communication tools, as appropriate. Towards this end, each Party shall adopt and implement effective legislative, executive, administrative, or other measures, to promote public awareness of, and access to, information regarding the adverse health,economics, and environmental consequences of tobacco production and consumption.			- During past year in school, students were taught about dangers of smoking - During past year in school, students discussed reasons people their age smoke - During past year in school, students were taught about the effects of smoking	

Table 4.12 European School Survey Project on Alcohol and Other Drugs (ESPAD), Global School-Based Student Health Survey (GSHS), Global Youth Tobacco Survey (GYTS), and Health Behavior of School-Aged Children (HBSC) Measures That Can Be Used to Monitor the WHO FCTC

WHO FCTC Article	ESPAD	GSHS	GYTS	HBSC
Media and Advertising Article 13: **Tobacco advertising, promotion, and sponsorship.** Parties recognize that a comprehensive ban on advertising, promotion, and sponsorship would reduce the consumption of tobacco products			- During the past month, saw actors smoking on TV, in videos, or in movies - During the past month, saw ads for cigarettes on billboards - During the past month, saw ads for cigarettes in newspapers or magazines - During the past month, saw ads for cigarettes at sporting events, fairs, concerts, or community events - Have an object with a cigarette brand logo on it	
Cessation Article 14: **Demand reduction measures concerning tobacco dependence and cessation.** Each Party shall develop and disseminate appropriate, comprehensive, and integrated guidelines based on scientific evidence and "best practices," taking into account national circumstances and priorities, and shall take effective measures to promote cessation of tobacco use and adequate treatment for tobacco dependence		- Attempts to stop smoking during the past 12 months	- Current smokers who desire to stop smoking - Current smokers who tried to stop smoking during the past year - Current smokers who ever received help or advice from a programme or professional to help them stop smoking - Current smokers who have or feel like having a cigarette first thing in the morning	

Table 4.12 European School Survey Project on Alcohol and Other Drugs (ESPAD), Global School-Based Student Health Survey (GSHS), Global Youth Tobacco Survey (GYTS), and Health Behavior of School-Aged Children (HBSC) Measures That Can Be Used to Monitor the WHO FCTC

WHO FCTC Article	ESPAD	GSHS	GYTS	HBSC
Minor's Access and Availability Article 16: **Sales to and by minors.** Each Party shall adopt and implement effective legislative, executive, administrative, or other measures, at the appropriate level to prohibit the sales of tobacco products to persons under the age set by domestic law, national law, or age eighteen. Each Party shall prohibit or promote the prohibition of the distribution of free tobacco products to the public and especially minors.			- Current smokers who usually get their cigarettes by buying them in a store, in a shop, or from a street vendor - Current smokers who were not refused purchase of cigarettes because of their age - Students who were offered "free" cigarettes by a cigarette company representative	

Table 4.12 European School Survey Project on Alcohol and Other Drugs (ESPAD), Global School-Based Student Health Survey (GSHS), Global Youth Tobacco Survey (GYTS), and Health Behavior of School-Aged Children (HBSC) Measures That Can Be Used to Monitor the WHO FCTC

grammes in all WHO Member States.

How do data from the surveillance systems identified in this section assist countries in monitoring and evaluating articles from the WHO FCTC? As illustrated in Tables 4.12 and 4.13, these systems provide valuable indicators for measuring achievement of WHO FCTC articles. The WHO FCTC calls for countries to use consistent methods and procedures in their surveillance efforts. The surveys described in this section were created with the intention of providing internationally comparable data by employing research protocols with common sampling procedures, core questionnaire items, field procedures, and data management across survey sites.

The WHO FCTC also requires countries to monitor the treaty's application over time. Surveillance data that encompasses a broad range of information about tobacco use behaviour, and associated factors, are a necessary component of applied research that establishes evidence-based relationships between programme efforts and policy outcomes. In addition, the WHO FCTC contributes to strengthening the leadership capacity of the ministries of health and other state bodies responsible for tobacco control, not only in terms of public health advocacy, but also in negotiations with other sectors with respect to tobacco control. Finally, ongoing, systematic surveillance enhances the role of the nongovernmental sector by supporting civil society participation in monitoring the state of tobacco control efforts, and facilitating policy and programme development.

WHO FCTC Article	International Tobacco Control Policy Evaluation Survey (ITC)	STEPwise Approach to Chronic Disease Factor Surveillance (STEPS)	Global Adult Tobacco Survey (GATS)
Article 20: **Research, surveillance and exchange of information.** The Parties shall establish, as appropriate, programmes for national, regional, and global surveillance of the magnitude, patterns, determinants, and consequences of tobacco consumption and exposure to tobacco smoke. Towards this end, the Parties should integrate tobacco surveillance programmes into national, regional, and global health surveillance programmes so that data are comparable and can be anal-ysed at the regional and international levels, as appropriate.	The objective of the ITC is to apply rigorous research methods to evaluate the psychosocial and behavioural effects of national level tobacco control policies. The ITC Project uses multiple country controls, longitudinal designs, and theory-driven mediational models that allow tests of hypotheses about the anticipated effects of given policies.	STEPS provides information on NCD risk behaviours that countries can use for better public health policy decision-making. The goal of STEPS is to build the capacity of countries to develop and maintain an integrated, systematic data collection system that collects data on NCDs, and their risk factors. There are currently two primary STEPS surveillance systems: STEPwise approach to risk factor surveillance and the STEPwise approach to stroke surveillance.	The Bloomberg Initiative partners established the GATS in 15 high-burden countries to collect data on tobacco use prevalence (cigarette smoking and other tobacco use), exposure to secondhand smoke, cessation, risk perceptions, knowledge and attitudes, exposure to media, price, and taxation issues which are critical measures for tobacco control programme and policy development.
Prevalence Article 21: **Reporting and exchange of information.** Each Party shall submit to the Conference of the Parties, through the Secretariat, periodic reports on its implementation of this Convention, which should include the following: information on surveillance and research as specified in Article 20 (research, surveillance and exchange of information)	- Respondents are eligible to participate if they have smoked 100 cigarettes in their lifetime and currently smoke (manufactured or hand-rolled) cigarettes - Current daily smoking (manufactured or hand-rolled) - Daily cigarette consumption - Weekly cigarette consumption - Type of product smoked (hand-rolled or manufactured; menthol, Virginia, or blended; pieces in pack; filtered or non-filtered) - Cigarette brand preference - Duration of smoking (time since respondent started smoking) - Dependency (time to first smoke) - Current use of tobacco products other than cigarettes (including cigars, pipes, chewing tobacco, snuff, and other products)	- Current smoking of any tobacco products (such as cigarettes, cigars, or pipes) - Currently daily smoking of tobacco products - Age of initiation of daily smoking - Daily consumption of tobacco (manufactured cigarettes, hand-rolled cigarettes, pipes full of tobacco, cigars/cheroots/cigarillos, or other) - Expanded tobacco use questions include: ever smoke daily; age when stopped smoking daily; current use of smokeless tobacco, such as snuff, chewing tobacco, betel; current daily use of smokeless tobacco products; number of times a day use smokeless tobacco products; and ever daily use of smokeless tobacco, such as snuff, chewing tobacco, betel.	- Current smoking of any tobacco products (such as cigarettes, cigars, or pipes) - Current daily smoking of tobacco products - Age of initiation of daily smoking for daily smokers - Age of first cigarette smoked for less than daily smokers - Daily consumption of smoked and smokeless tobacco (including manufactured cigarettes, hand-rolled cigarettes, pipes full of tobacco, cigars/cheroots/cigarillos, water pipe rocks, or other smoked products, and snuff, chewing tobacco, betel, and other smokeless products)

Table 4.13 International Tobacco Control Policy Evaluation Survey (ITC), STEPwise Approach to Chronic Disease Factor Surveillance (STEPS), Global Adult Tobacco Survey (GATS) Measures That Can Be Used to Monitor the WHO Framework Convention for Tobacco Control (FCTC)

WHO FCTC Article	International Tobacco Control Policy Evaluation Survey (ITC)	STEPwise Approach to Chronic Disease Factor Surveillance (STEPS)	Global Adult Tobacco Survey (GATS)
Exposure to Secondhand Smoke			
Article 8: **Protection from exposure to tobacco smoke.** Each Party shall adopt and implement in areas of existing national jurisdiction, as determined by national law, and actively promote at other jurisdictional levels, the adoption and implementation of effective legislative, executive, administrative, and/or other measures, providing for protection from exposure to tobacco smoke in indoor work and public places, public transport, and, other public places.	- Number of closest friends who smoke - Smoking permitted in home - Smoking policies in places respondent goes often - Smoking policy at respondents' place of work - Support for smoking regulations in indoor public areas		- Number of family members who smoke - Smoking permitted in home - Smoking policies in places respondent goes often - Smoking policy at respondents' place of work - Support for smoking regulations in indoor public areas
Knowledge			
Article 12: **Education, communication, training and public awareness.** Each Party shall promote and strengthen public awareness of tobacco control issues, using all available communication tools, as appropriate. Towards this end, each Party shall adopt and implement effective legislative, executive, administrative, or other measures, to promote public awareness of, and access to, information regarding the adverse health, economics, and environmental consequences of tobacco production and consumption.	- Knowledge of health effects and diseases caused by smoking - Beliefs about dangers of different tobacco products - Perception of relative danger of tobacco products other than cigarettes		- Knowledge of health effects and diseases caused by smoking - Beliefs about dangers of different tobacco products - Perception of relative danger of tobacco products other than cigarettes

Table 4.13 International Tobacco Control Policy Evaluation Survey (ITC), STEPwise Approach to Chronic Disease Factor Surveillance (STEPS), Global Adult Tobacco Survey (GATS) Measures That Can Be Used to Monitor the WHO Framework Convention for Tobacco Control (FCTC)

WHO FCTC Article	International Tobacco Control Policy Evaluation Survey (ITC)	STEPwise Approach to Chronic Disease Factor Surveillance (STEPS)	Global Adult Tobacco Survey (GATS)
Media and Advertising Article 13: **Tobacco advertising, promotion, and sponsorship.** Parties recognize that a comprehensive ban on advertising, promotion, and sponsorship would reduce the consumption of tobacco products	- Module of questions regarding warning labels - Module of questions about pro-tobacco advertising on television, radio, billboards, internet, shop windows, in newspapers, restaurants, and discos - Tobacco industry sponsorship of sporting or cultural events - Module of questions about awareness campaigns that shows dangers of smoking or encourages quitting in the past 6 months		- Module of questions regarding warning labels - Module of questions about pro-tobacco advertising on television, radio, billboards, internet, shop windows, in newspapers, restaurants, and discos - Module of questions about awareness campaigns that shows dangers of smoking or encourages quitting in the past 6 months
Cessation Article 14: **Demand reduction measures concerning tobacco dependence and cessation.** Each Party shall develop and disseminate appropriate, comprehensive, and integrated guidelines based on scientific evidence and "best practices," taking into account national circumstances and priorities, and shall take effective measures to promote cessation of tobacco use and adequate treatment for tobacco dependence.	- Desire to quit - Quit attempts - Duration of last smoke-free period - Knowledge about NRT and Zyban - Use of NRT or other cessation assistants - Cessation services available (doctor or health professional, telephone quit line, clinics, participation in international events such as Quit and Win Contests) - Perceived difficulty to quit smoking		- Desire to quit - Quit attempts - Duration of last smoke-free period - Knowledge about NRT and Zyban - Use of NRT or other cessation assistants - Cessation services available (doctor or health professional, telephone quit line, clinics) - Perceived difficulty to quit smoking

Table 4.13 International Tobacco Control Policy Evaluation Survey (ITC), STEPwise Approach to Chronic Disease Factor Surveillance (STEPS), Global Adult Tobacco Survey (GATS) Measures That Can Be Used to Monitor the WHO Framework Convention for Tobacco Control (FCTC)

Summary and recommendations

The youth surveillance systems described in this section include: The European School Survey Project on Alcohol and Other Drugs (ESPAD), the Global School-Based Student Health Survey (GSHS), the Global Youth Tobacco Survey (GYTS), and the Health Behavior in School-Aged Children Survey (HBSC). The adult surveillance systems described include: the Global Adult Tobacco Survey (GATS), the International Tobacco Control Survey (ITC), and the STEPwise Approach to Chronic Disease Factor Surveillance (STEPS).

To evaluate among youth articles of the WHO FCTC, the GYTS is the only source of international data available which includes the following indicators: exposure to secondhand smoke, exposure to pro- and anti-tobacco media and advertising, cessation, minors' access to tobacco products, and school curriculum.

To evaluate among adults articles of the WHO FCTC, GATS, and ITC have the most comprehensive set of indicators, including: exposure to secondhand smoke, economics (price and taxation), cessation, product labeling, and exposure to pro- and anti-tobacco media and advertising. Where possible longitudinal studies, such as ITC, should be used for evaluating policies and programmes, because of the opportunity to examine and adjust for individual level predictors of tobacco use behaviours (see Section 2.1).

GYTS was developed, and GATS is being developed, for countries which did not have existing surveillance systems for the collection of information on tobacco use and its determinants.

Countries interested in developing a tobacco control surveillance system are encouraged to join one of these international systems. Those countries that have existing national surveys are encouraged to link to these international efforts.