ORIGINAL INVESTIGATION

Research Priorities for FCTC Articles 20, 21, and 22: Surveillance/Evaluation and Information Exchange

Gary A. Giovino PhD, MS[1], **Jessica A. Kulak** MS, MPH[1], **William D. Kalsbeek** PhD[2], **Scott J. Leischow** PhD[3]

[1]*Department of Community Health and Health Behavior, School of Public Health and Health Professions, University at Buffalo, The State University of New York, Buffalo, NY;* [2]*Survey Research Unit, Department of Biostatistics, University of North Carolina, Chapel Hill, NC;* [3]*Mayo Clinic, Scottsdale, AZ*

Corresponding Author: Gary A. Giovino, Ph.D., M.S., Department of Community Health and Health Behavior, School of Public Health and Health Professions, University at Buffalo, The State University of New York, 310 Kimball Tower, Buffalo, NY 14214-8028; USA. Telephone: 716-829-6952; Fax: 716-829-6040; E-mail: ggiovino@buffalo.edu

ABSTRACT

Introduction: Framework Convention on Tobacco Control (FCTC) Articles 20, 21, and 22 call for strong monitoring and reporting of tobacco use and factors influencing use and disease (Articles 20 and 21) and for collaboration among the Parties and relevant organizations to share resources, knowledge, and expertise on all relevant tobacco control strategies (Article 22).

Methods: This paper provides background information and discusses research strategies that would strengthen these efforts and better inform the Parties. By necessity, Articles 20 and 21 are discussed separately from Article 22, although 1 example that relates to both 20/21 and 22 is discussed at the end.

Results: Twelve important research opportunities on surveillance and evaluation are recognized, along with 4 on collaboration. The authors believe that the 6 most important areas for research would study (a) possible underreporting of tobacco use among certain demographic groups in some countries, (b) measures of industry activities, (c) optimal sampling strategies, (d) sentinel surveillance, (e) networks of tobacco companies and their partners as they promote tobacco use and interfere with implementation of the FCTC, and (f) network/relationship factors that impact diffusion of knowledge and decision making on the implementation of the FCTC. In addition, we call for a review process of existing surveillance and evaluation strategies to coordinate activities to make optimal use of existing resources. This activity would involve networking as prescribed in Article 22.

Conclusions: Studies and activities such as these would facilitate control of the tobacco epidemic.

WHAT THE TREATY REQUIRES FOR ARTICLES 20, 21, AND 22

The Framework Convention on Tobacco Control (FCTC) calls upon countries to implement evidence-based strategies to reduce tobacco use and tobacco-attributable morbidity and mortality (World Health Organization [WHO], 2003). Here, we review FCTC Articles 20, 21, and 22, which call for strong monitoring of the tobacco epidemic, information exchange, and collaboration among Parties and other relevant organizations (Tables 1–3).

More specifically, Article 20 calls initially for "research that addresses determinants and consequences of tobacco consumption and exposure to tobacco smoke as well as research for identification of alternative crops." It also requires "programmes for national, regional, and global surveillance of the magnitude, patterns, determinants, and consequences of tobacco consumption and exposure to tobacco smoke" and for parties to establish and maintain "an updated database of laws and regulations on tobacco control and, as appropriate, information about their enforcement, as well as pertinent jurisprudence, and cooperate in the development of programmes for regional and global tobacco control."

Article 21 (section 1d) requires nations to provide regular updates on surveillance and research, as specified in Article 20. When properly enacted, Articles 20 and 21 will ensure that data are available to provide feedback to countries on the relative effectiveness of programs and policies.

Article 22 is fundamentally about knowledge transfer and capacity building within the network of FCTC Parties. Thus, Parties are required to cooperate and collaborate with each other in order to facilitate "the transfer of technical, scientific and legal expertise and technology" that will allow countries to effectively implement the Article. More specifically, the Article requires the "facilitation of the development, transfer and acquisition of technology, knowledge, skills, capacity and expertise related to tobacco control," along with the provision of expertise and training needed to develop and implement FCTC policies. In addition,

Research priorities for FCTC Articles 20, 21, and 22

Table 1. Article 20: Research, Surveillance, and Exchange of Information

1. The Parties undertake to develop and promote national research and to coordinate research programs at the regional and international levels in the field of tobacco control. Toward this end, each Party shall:
   (a) Initiate and cooperate in, directly or through competent international and regional intergovernmental organizations and other bodies, the conduct of research and scientific assessments, and in doing so promote and encourage research that addresses the determinants and consequences of tobacco consumption and exposure to tobacco smoke as well as research for identification of alternative crops; and
   (b) Promote and strengthen, with the support of competent international and regional intergovernmental organizations and other bodies, training and support for all those engaged in tobacco control activities, including research, implementation, and evaluation.
2. The Parties shall establish, as appropriate, programs for national, regional, and global surveillance of the magnitude, patterns, determinants, and consequences of tobacco consumption and exposure to tobacco smoke. Toward this end, the Parties should integrate tobacco surveillance programs into national, regional, and global health surveillance programs so that data are comparable and can be analyzed at the regional and international levels, as appropriate.
3. Parties recognize the importance of financial and technical assistance from international and regional intergovernmental organizations and other bodies. Each Party shall endeavor to:
   (a) Establish progressively a national system for the epidemiological surveillance of tobacco consumption and related social, economic, and health indicators;
   (b) Cooperate with competent international and regional intergovernmental organizations and other bodies, including governmental and nongovernmental agencies, in regional and global tobacco surveillance and exchange of information on the indicators specified in paragraph 3(a) of this Article;
   (c) Cooperate with the World Health Organization in the development of general guidelines or procedures for defining the collection, analysis, and dissemination of tobacco-related surveillance data.
4. The Parties shall, subject to national law, promote and facilitate the exchange of publicly available scientific, technical, socioeconomic, commercial, and legal information, as well as information regarding practices of the tobacco industry and the cultivation of tobacco, which is relevant to this Convention, and in so doing shall take into account and address the special needs of developing country Parties and Parties with economies in transition. Each Party shall endeavor to:
   (a) Progressively establish and maintain an updated database of laws and regulations on tobacco control and, as appropriate, information about their enforcement, as well as pertinent jurisprudence, and cooperate in the development of programs for regional and global tobacco control;
   (b) Progressively establish and maintain updated data from national surveillance programs in accordance with paragraph 3(a) of this Article; and;
   (c) Cooperate with competent international organizations to progressively establish and maintain a global system to regularly collect and disseminate information on tobacco production, manufacture, and the activities of the tobacco industry, which have an impact on the Convention or national tobacco control activities.

Note. WHO (2003). Reproduced with permission from the World Health Organization.

Table 2. Article 21: Reporting and Exchange of Information

1. 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:
   (a) Information on legislative, executive, administrative, or other measures taken to implement the Convention;
   (b) Information, as appropriate, on any constraints or barriers encountered in its implementation of the Convention, and on the measures taken to overcome these barriers;
   (c) Information, as appropriate, on financial and technical assistance provided and received for tobacco control activities;
   (d) Information on surveillance and research as specified in Article 20; and
   (e) Information specified in Articles 6.3, 13.2, 13.3, 13.4(d), 15.5, and 19.2.
2. The frequency and format of such reports by all Parties shall be determined by the Conference of the Parties. Each Party shall make its initial report within 2 years of the entry into force of the Convention for that Party.
3. The Conference of the Parties, pursuant to Articles 22 and 26, shall consider arrangements to assist developing country Parties and Parties with economies in transition, as their request, in meeting their obligations under this Article.
4. The reporting and exchange of information under the Convention shall be subject to national law regarding confidentiality and privacy. The Parties shall protect, as mutually agreed, any confidential information that is exchanged.

Note. WHO (2003). Reproduced with permission from the World Health Organization.

specific mention is made of identifying and promoting tobacco control methods, including tobacco treatment.

Policy makers may lack the scientific background to assess the quality and implications of scientific data (Koplan & Mackay, 2012). They can also be influenced by tobacco industry representatives and the general public, who can be misinformed. Thus, while systems exist to generate high-quality data, we also need to understand if and how the information they generate can be optimally disseminated, as called for by Article 22.

Although Articles 20/21 and 22 are conceptually related, they have differing contextual backgrounds and research needs.

Table 3. Article 22: Cooperation in the Scientific, Technical, and Legal Fields and Provision of Related Expertise

1. The Parties shall cooperate directly or through competent international bodies to strengthen their capacity to fulfill the obligations arising from this Convention, taking into account the needs of developing country Parties and Parties with economies in transition. Such cooperation shall promote the transfer of technical, scientific, and legal expertise and technology, as mutually agreed upon, to establish and strengthen national tobacco control strategies, plans, and programs aiming at, inter alia:
   (a) Facilitation of the development, transfer and acquisition of technology, knowledge, skills, capacity, and expertise related to tobacco control;
   (b) Provision of technical, scientific, legal, and other expertise to establish and strengthen national tobacco control strategies, plans, and programs, aiming at implementation of the Convention through, inter alia:
      (i) Assisting, upon request, in the development of a strong legislative foundation as well as technical programs, including those on prevention of initiation, promotion of cessation, and protection from exposure to tobacco smoke;
      (ii) Assisting, as appropriate, tobacco workers in the development of appropriate economically and legally viable alternative livelihoods in an economically viable manner; and
      (iii) Assisting, as appropriate, tobacco growers in shifting agricultural production to alternative crops in an economically viable manner;
   (c) Support for appropriate training or sensitization programs for appropriate personnel in accordance with Article 12;
   (d) Provision, as appropriate, of the necessary material, equipment, and supplies, as well as logistical support for tobacco control strategies, plans, and programs;
   (e) Identification of methods for tobacco control, including comprehensive treatment of nicotine addiction; and
   (f) Promotion, as appropriate, of research to increase the affordability of comprehensive treatment of nicotine addiction.
2. The Conference of the Parties shall promote and facilitate transfer of technical, scientific, and legal expertise and technology with the financial support secured in accordance with Article 26.

Note. WHO (2003). Reproduced with permission from the World Health Organization.

This paper will, therefore, be organized along two separate streams, one for Articles 20/21 (surveillance/evaluation) and another for Article 22 (information exchange). For each topic, we will describe relevant background and history, followed by a brief summary of what is known about the topic. We will then make recommendations for research that will support fulfillment of the articles. Unlike the other papers in this special issue, there is no history of regulation for either of these topics, so we will describe the development of surveillance systems and networks instead.

The purpose of the paper is to describe various systems that are in place and then recommend research that would strengthen the work that is currently being done. We will not recommend specific questionnaire items that should be used across all surveys. The items used in various systems are generally determined in consultation with international tobacco control and survey experts. They generally have been cognitively tested before being fielded, and have now been asked of hundreds of thousands of persons. Changes to the specific items in tobacco surveillance systems are generally done when international experts are reconvened to consider what's been learned from field experience. If readers wish to learn more about specific survey items, we recommend consulting the international surveillance systems described below, as well as a recent report by the International Agency for Research on Cancer (IARC, 2008).

SURVEILLANCE AND EVALUATION

Brief History of Tobacco Surveillance and Evaluation

Public health surveillance is defined as "the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action in order to reduce morbidity and mortality and to improve health." Data disseminated in this manner can be used for "immediate public health action, program and policy planning and evaluation, and formulating and testing research hypotheses" (Centers for Disease Control and Prevention [CDC], 2001). Early public health surveillance activities included the monitoring of persons who had come in contact with people infected with diseases such as typhus, smallpox, and plague (in the 1900s); population monitoring of notifiable infectious diseases (1950s); and systematic surveillance of noncommunicable diseases such as cancer, congenital malformations, and lead poisoning in children (1970s) (Wegner, Rohan, & Remington, 2010).

Program evaluation is "the systematic examination and assessment of features of an initiative and its effects, in order to produce information that can be used by those who have an interest in its improvement or effectiveness" (WHO European Working Group on Health Promotion Evaluation, 1998). Data from surveillance and evaluation systems are collected, analyzed, interpreted, and reported. Knowledge obtained from well-conducted evaluations can be used to disseminate effective policies and programs and when necessary to design new programs and policies for subsequent evaluation (Wegner et al., 2010).

Tobacco surveillance and evaluation systems consist of the data systems themselves, expertise brought by those in the field, the commitment to continued evaluation of the systems, as well as a commitment to the dissemination and use of acquired data (Brownson, Baker, Leet, Gillespie, & True, 2011). A tobacco-related surveillance and evaluation system is designed to provide timely information about populations on the prevalence of use of various products (both tobacco and pharmaceutical); factors that influence their use; the incidence, prevalence, and mortality from tobacco-attributable diseases; and the impact of tobacco control programs and policies on relevant outcomes (Giovino et al., 2009). Data from such systems can help justify and conduct research initiatives, programs, and policies; identify high-risk populations; assess the consequences of various

harm-reduction strategies; and provide background for setting realistic public health objectives.

To our knowledge, the first government-sponsored national survey on tobacco use was conducted in 1955 in the United States (Haenszel, Shimkin, & Miller, 1956). The United States subsequently developed an extensive tobacco surveillance system (Giovino, 2000; Giovino et al., 2009). It will soon include a large and comprehensive cohort study, the Population Assessment of Tobacco and Health (PATH) Study (Borek, 2012). In the United States and the United Kingdom, survey work often incorporates biochemical assessment of cotinine, which has been used, among other ways, to study nicotine delivery in various types of cigarettes (Caraballo et al., 2011; Jarvis, Boreham, Primatesta, Feyerabend, & Bryant, 2001), validity of self-reported smoking status (Caraballo, Giovino, & Pechacek, 2004; Caraballo, Giovino, Pechacek, & Mowery, 2001; Jarvis, Fidler, Mindell, Feyerabend, & West, 2008), and the effects of smoking bans on exposure to tobacco smoke pollution (Jarvis, Sims, Gilmore, & Mindell, 2012; Pickett et al., 2006; Sims et al., 2012). The Smoking Toolkit Study monitors smoking patterns every month in England with cross-sectional interviews; respondents are subsequently asked about cessation-related behaviors in follow-up assessments (Fidler et al., 2011).

To facilitate cross-country comparisons, three major international surveillance systems have been established. The WHO has provided guidelines on tobacco surveillance for several decades (WHO, 1998), and now includes measures of tobacco use in the STEPwise approach to Surveillance (STEPS). The Global Tobacco Surveillance System (GTSS) was established in 1999 and includes the Global Youth Tobacco Survey (GYTS), Global Adult Tobacco Survey (GATS), and the Global Health Professions Student Survey (GHPSS). GTSS is coordinated by WHO, the CDC, and the CDC Foundation. The International Tobacco Control Policy Evaluation Project (ITC Project) began in 2002, and is administered primarily at the University of Waterloo (Canada). These systems will be discussed in more detail below.

Multiple publications have provided guidelines or recommendations for tobacco surveillance and evaluation (e.g., Baris et al., 2000; Bogen et al., 2009; Bonnie, Stratton, & Wallace, 2007; Bostic, 2012; Cruz, 2009; Delnevo & Bauer, 2009; Farrelly, 2009; Giovino et al., 2009; Hatsukami et al., 2005; IARC, 2008; O'Connor, 2011; O'Connor et al., 2009; Reddy et al., 2011; Starr et al., 2005; Stellman & Djordjevic, 2009; Stratton, Shetty, Wallace, & Bondurant, 2001; WHO, 1998). The recommendations of Reddy and colleagues (2011; Table 4) are detailed and timely. They do not, however, describe product monitoring, which can also influence policy (Bogen et al., 2009; Gray & Borland, 2012; Hatsukami et al., 2005; O'Connor, 2011; O'Connor et al., 2009; Stellman & Djordjevic, 2009; Stratton et al., 2001). Monitoring of countries' tobacco control efforts is also conducted via shadow reporting (Bostic, 2012). The Framework Convention Alliance (FCA) acts as a "watch dog," to ensure that Parties are implementing and enforcing the laws they pass to comply with the treaty.

What Is Known About Tobacco Surveillance and Evaluation

IARC (2008) recommends that surveys be used to measure exposure to policies such as smoke-free air legislation, antitobacco mass media campaigns, protobacco marketing, and price increases. According to the CDC, there are certain attributes surveillance systems should embody. These include: (a) Simplicity—the structure and ease of operation for a surveillance system should be as simple as possible while still able to meet its objectives. (b) Flexibility—the ability to adapt to changing needs or be integrated with other systems. (c) Data quality—public health surveillance should acquire data that are complete and valid. (d) Acceptability—reflective of the willingness of individuals and/or organizations to participate in the surveillance. (e) Sensitivity—sensitivity at dual levels is necessary; it refers to both the proportion of cases of a disease (or users of a product) detected by the surveillance system as well as the ability to detect outbreaks and monitor changes in the number of cases/users over time. (f) Representativeness—the ability of the surveillance system to accurately describe the occurrence of disease/health-related events and its distribution in the population. (g) Timeliness—reflective of the speed between steps in the surveillance system. (h) Stability—the reliability (provides data without fail) and availability (operational when needed) of the public health surveillance system (CDC, 2001).

In its three reports on the global tobacco epidemic (WHO, 2008b, 2009, 2012f), WHO provides information on the prevalence of daily smoking from multiple surveys and on key FCTC policies, as represented by the MPOWER package (WHO, 2008b). Survey data on tobacco use prevalence are reported for most countries in the WHO Global Infobase (WHO, 2011).

Three International Surveillance/Evaluation Systems

The first of the three international systems we will describe is the WHO STEPS system, which provides a standardized method for countries to collect data on multiple risk factors, including tobacco use (WHO, 2012a). The questionnaire-based measurement system permits identification of some important tobacco use indicators. STEPS produces country reports (WHO, 2012j). Data collection, entry, and analysis tools are available for download (WHO, 2012k), and the STEPS instrument and question-by-question guide can be found online (WHO, 2012l).

The second is the GTSS, which consists of surveys such as the GYTS, the GHPSS, and the GATS (CDC, 2011a; Giovino et al., 2012; Warren, Asma, Lee, Lea, & Mackay, 2009). GTSS data include measures of use and of policy and other factors that influence use. GTSS produces country reports (CDC, 2012a), fact sheets (CDC, 2012b), and scientific publications, including journal articles and *MMWR* surveillance summaries and articles (CDC, 2012c). Datasets are available for download (CDC, 2012d), as are documentation and other resources, including questionnaires (CDC, 2012e).

GYTSs have been conducted in 182 countries/sites (15 of which were not UN states). GYTS is a school-based survey of 13- to 15-year-old students. It is designed to provide prevalence estimates of cigarette smoking and the use of other tobacco products; as well as data on students' attitudes about tobacco; access to tobacco products; cessation intentions and practices; and their exposure to media influences, relevant school curricula, and tobacco smoke pollution (e.g., CDC, 2006, 2007; Warren, Jones, Eriksen, Asma, & Global Tobacco Surveillance System collaborative group, 2006). The GYTS questionnaire has recently been updated to facilitate measurement of MPOWER strategies.

Table 4. WHO Prioritized Research Agenda for Tobacco Control

"A range of information is required by policy-makers, programme managers and others working to reduce tobacco use and its consequences. This includes data on tobacco use patterns (including, for all smoked and smokeless tobacco products, prevalence, consumption, initiation and cessation behaviours) and the health consequences of tobacco use (including those from exposure to tobacco smoke and use of non-cigarette forms of tobacco); adoption and implementation of tobacco control policies and compliance with those policies; tobacco product sales, tax revenues, and extent of tobacco tax avoidance and tax evasion; resources devoted to and activities of tobacco control programmes; awareness of risks from tobacco use and exposure to communication and education-related efforts; the economic contribution of tobacco growing and manufacturing and the health care, lost productivity and other economic costs of tobacco use; tobacco industry tactics, including tobacco product pricing, tobacco company marketing activities and industry lobbying and other efforts to undermine tobacco control activities; social norms about tobacco use and support for tobacco control policies and programmes; and the social determinants of tobacco use. Tobacco-related surveillance requires the regular collection and analysis of representative and reliable data for the development of tobacco control policies and programmes of action. This surveillance information is needed for assessing the population-level impact of tobacco control interventions, as well as their impact on vulnerable populations, including children and adolescents, the poor, and women of childbearing age. The collection of data using representative and reliable instruments across all economic and social settings allows for comparability of measures across those settings.

Efforts to develop comprehensive surveillance systems for tobacco use in low- and middle-income countries are in their early stages. Most low- and middle-income countries do not conduct regular surveys to monitor tobacco use patterns, knowledge about the health consequences of tobacco use and exposure to environmental tobacco smoke, attitudes towards tobacco control policies, and other tobacco-related knowledge, attitudes, beliefs and practices. The reporting process mandated by the WHO Framework Convention on Tobacco Control, the Global Adult Tobacco Survey, the Global Youth Tobacco Survey, the WHO STEPwise approach to chronic disease risk factor surveillance (STEPS), the WHO report on the global tobacco epidemic, and related efforts in many countries are addressing this gap, but much remains to be done to ensure ongoing surveillance, particularly with respect to policy implementation and tobacco company activities. This includes a need for culturally appropriate behavioural research instruments and tools for adequately assessing the local context in low- and middle-income countries."

Note. Reddy et al. (2011). Reproduced with permission from the World Health Organization.

The GATS is designed to provide nationally representative estimates of more than 15 indicators of tobacco use prevalence among persons who are at least 15 years old (Giovino et al., 2012). GATS also provides information on social determinants of use, respondents' knowledge of health effects, exposures to tobacco smoke pollution and protective policies, cessation intentions and practices, exposures to warning labels and antitobacco media campaigns, exposure to protobacco media messages, and economic indicators (e.g, CDC, 2011b, 2012f; King, Mirza, & Babb, 2012; Kostova et al., 2012; Palipudi et al., 2012). At the time of this writing, GATS has been conducted in 18 countries, with 13 others in process. Repeat surveys in all 14 Wave I countries (originally surveyed during 2008–2010) will be conducted. The GATS Collaborative Group has also compiled a subset of questions that countries can incorporate into existing national surveys. *Tobacco Questions for Surveys* (*TQS*) (GATS Collaborative Group, 2011a) has been designed to allow countries to collect data on tobacco use and factors influencing use that facilitate comparability with GATS estimates because they use a subset of the questions on the full GATS questionnaire. To date, 11 countries have implemented or have committed to implementing the *TQS* as part of their ongoing national surveillance systems. Additional information about GATS methodologies is available at www.who.int/tobacco/surveillance/guide/en/index.html (WHO, 2012i).

The third system is the ITC Project, which incorporates a pre–post cohort design using multiple country controls to take advantage of natural experiments that occur as countries adopt new tobacco control policies (Fong, 2011; Fong et al., 2006). The first international cohort study of tobacco use and factors influencing use, the ITC Project has been designed to measure, at the national level, the psychosocial and behavioral impacts of FCTC policies. Since 2002, ITC surveys have been conducted in 22 countries and have provided valuable feedback on policies and practices including smoking bans, warning labels, taxes, mass media, and cessation (e.g., Fong et al., 2006; Hammond, Fong, McNeill, Borland, & Cummings, 2006; Harris et al., 2006; Hyland et al., 2006; Kasza et al., 2013; Li et al., 2009). The ITC questionnaire is much more detailed than the GATS questionnaire. ITC produces scientific publications, national reports, policy reports, country summaries, technical reports, and working papers (ITC Project, 2011a). By selecting an ITC participating country (ITC Project, 2011b), readers are provided with survey dates, sample sizes, a review of tobacco control policies, a timeline, select publications, and contact information relevant to that particular country. Documentation and methods are available (ITC Project, 2011c), as are requests for data (ITC Project, 2011d). Survey questionnaires, organized by country, are also available (ITC Project, 2011e).

The Survey Error Context in Tobacco Use Research

Sample surveys of adult household residents and adolescent and young adult students play a critical role in monitoring tobacco use and factors that influence use. However, estimates of quantifiable tobacco use characteristics from samples of targeted populations are subject to survey error, generally defined as the difference between the estimate and the actual value of the population characteristic (Biemer, 2010; Groves & Lyberg, 2010; Kish, 1965; Lessler & Kalsbeek, 1992). Survey error consists of several component parts associated with various steps of the survey process and whether the error is randomly variable among design outcomes (variance) or subject to systematic tendencies among these outcomes (bias). Sampling error occurs since population estimates are obtained using data from a portion of the target population, frame error arises from

limitations in the lists from which samples are drawn, nonresponse error is the result of failure to obtain data from all targeted members of the chosen sample, and measurement error happens whenever there are imperfections in the collection of surveillance data from survey respondents. General design principles associated with these sources of survey are presented elsewhere (Bradburn, Sudman, & Wansink, 2004; Groves et al., 2004; Lohr, 2010; Tourangeau, Rips, & Rasinski, 2000). When summed together these components of bias and variance equal the "total survey error" of estimates, which one hopes to minimize subject to resource constraints (Horvitz, 1978).

Survey error components are often estimable so that when combined with corresponding resource measures (e.g., unit costs), cost-efficient decisions can be made to finalize features of the survey design and limit the size of variance and bias contributions to total error. Indeed, quantifying components of survey error through separately designed methods research studies, along with the corresponding costs of survey operations, contributes to improved study design, a more thorough assessment of survey data quality, and ultimately a more informed interpretation of study findings.

MPOWER Framework for Assessing Variables of Interest

WHO developed the MPOWER package to facilitate support for the development and implementation of effective tobacco control strategies (WHO, 2008b). MPOWER serves to reduce tobacco use in the population by implementing six key strategies: monitor tobacco use, protect people from tobacco smoke, offer to help quit tobacco use, warn about the dangers of tobacco, enforce bans on tobacco advertising and promotion, and raise taxes on tobacco products. Several relevant variables used to measure MPOWER strategies are listed below. More detailed discussion of these and other variables is provided in *Methods for Evaluating Tobacco Control Policies* (IARC, 2008).

Monitor Tobacco Use

Topics measured include current use, initiation patterns, and cessation.

(1) Current use is an especially important construct because it is utilized as an outcome variable in policy evaluation. In the GYTS, a *current smoker/user* is someone who has smoked/used at least once during the previous 30 days (1 month), while a *current frequent user* is someone who used on ≥20 of the previous 30 days. Among adults, GATS defines a *current user* as one who smokes/uses tobacco daily or less than daily during the previous month; a *current daily user* is someone who reports using on a daily basis.

Other use measures include frequency of use (daily vs. non-daily, number of days used/month), type of tobacco product used (particularly important in countries where a variety of forms exist), intensity of use (the number of tobacco products used during a selected time period), brands used (reflecting the influence of marketing and product design), and an indicator of addiction (as measured, e.g., by time to first use upon waking) (IARC, 2008).

(2) Initiation patterns are generally measured in youth surveys and include intention/susceptibility to smoke, initial trial, age of first use, discontinuation after initial trial, and transition to established use (IARC, 2008). Having consumed ≥100 lifetime cigarettes is often considered as a threshold for *established use* (Choi, Gilpin, Farkas, & Pierce, 2001; IARC, 2008; Starr et al.,

2005). Youth who have become established users are at greater risk of continuing tobacco use as adults. These survey measures are adaptable for assessments of other tobacco products.

(3) Constructs measuring cessation include intention to quit, quit attempts (including planned vs. spontaneous as well as abrupt discontinuance vs. gradual reduction), and duration of abstinence in former smokers/users (IARC, 2008). A key outcome indicator of policies is whether they lead to an attempt to discontinue use.

Protect People From Tobacco Smoke

Article 7 calls for protection from tobacco smoke. Smoke-free policy compliance measures include self-reports, direct observation, and government compliance records. Self-report measures can be easily incorporated into existing population-based surveys and serve as an indication of policy impact. Assessing secondhand smoke exposure before policy implementation is of great importance in order to establish baseline data. Survey measures have been validated with atmospheric secondhand smoke monitoring and biomarkers of exposure in previous studies (IARC, 2008).

Offer Help to Quit

Assessing the effectiveness of tobacco cessation interventions is important in monitoring the adherence to and success of FCTC Article 14. Reach and efficacy, or effect size, are two key measures to be considered, as is the availability of specific interventions. Questions about awareness of these interventions and which (if any) have been used when making a quit attempt are also fundamental survey measures (IARC, 2008). Measures assessing dependence, barriers to seeking help, perceived impact of help, and attitudes regarding government policies and interventions are valuable for inclusion in surveys (IARC, 2008). Recent reports from ITC on quit attempts, attitudes about stop-smoking medications, and successful quitting provide useful information (Borland, Cooper, McNeill, O'Connor, & Cummings, 2011a; Borland, Partos, Yong, Cummings, & Hyland, 2011b; Kasza et al., 2013).

Warn About the Dangers of Tobacco

MPOWER recognizes the importance of warning the public about the dangers of tobacco use, and FCTC Article 11 addresses the role of tobacco product packaging and labeling in this. Evaluation of health warning policies should include measures such as awareness and knowledge of warnings, brand appeal, health knowledge, avoidance, and quit intentions. Emissions and constituent evaluations should measure awareness of knowledge, beliefs about contents, perceived risk, brand switching, and other moderating factors (IARC, 2008).

Article 12 promotes antitobacco public communication campaigns as another venue for influencing individuals' tobacco use behaviors and public support for social change (Coffman, 2002). Measures used to demonstrate campaign effectiveness are easiest to choose when the campaign itself is based on a specific change theory that describes campaign development from activities to outcomes. In this vein, formative (to inform effective campaign development), process (to recognize and correct problems over the course of the campaign), and outcome evaluations (to document the campaign's public health impact) are all necessary measures to evaluate campaign success (IARC, 2008).

Enforce Bans on Tobacco Advertising, Promotion, and Sponsorship

Article 13 of the FCTC targets tobacco advertising, promotion, and sponsorship due to evidence that enforcing these advertising bans will decrease tobacco use. A strong methodology for measuring the effectiveness of these bans is important for the tobacco control community. Two common methods are using econometric studies and consumer surveys. Information collected from surveys permits analyses of conceptual models that take into account policy-specific variables as well as psychosocial mediators (IARC, 2008). ITC and GATS assess exposure to protobacco marketing.

Raise Taxes on Tobacco

Applied in Article 6, tobacco taxation is a decidedly valuable method for controlling tobacco use and, therefore, related morbidities and mortality; when tax increases are implemented, there is a resulting decrease in the number of tobacco users and amount consumed by continuing users (Chaloupka et al., 2000; Jha & Chaloupka, 1999; Jha et al., 2006). While there are different methods (technology based, observational, and surveys) that are used to measure the impact of tobacco taxation, a regularly repeated population survey is an efficient approach for gathering data on a national measure of price and product purchasing behavior (IARC, 2008). Population-based surveys are effective measures of collecting price data of tobacco products as well as brand and brand-characteristic details. The price data are then used to evaluate how changes in taxation affect the price consumers pay for tobacco products (IARC, 2008).

Research Oportunities to Inform Tobacco Surveillance/Evaluation

Research needs are multiple and ongoing.

1. Validity of self-reported tobacco use behaviors. Although self-reports of tobacco smoking/use from population-based surveys are generally reliable and valid (Barnea, Rahav, & Teichman, 1987; Brigham et al., 2008; Caraballo et al., 2001, 2004; Patrick et al., 1994; Vartiainen, Seppälä, Lillsunde, & Puska, 2002; Velicer, Prochaska, Rossi, & Snow, 1992), recent reports have raised concerns about the misclassification of use as nonuse (West, Zatonski, Przewozniak, & Jarvis, 2007), especially among women in cultures where smoking is socially unacceptable (Jung-Choi, Khang, & Cho, 2011; Laatikainen, Vartiainen, & Puska, 1999; Wewers et al., 1995). Research is needed to determine the nature and extent of underreporting in population-based surveys. Is underreporting more likely for women than men? Is it more likely among women in cultures where tobacco use is socially unacceptable? Does underreporting differ for different products? Since biochemical verification of self-reported tobacco use is generally impractical in large, nationally representative surveys, can small studies of convenience samples that use data collection methods similar to those of large-scale population-based surveys adequately test for underreporting? Would asking about the smoking status of the respondent's best friend in surveys provide useful data (Yeatman & Trinitapoli, 2011)? Could focus groups provide an inexpensive way to screen for information on whether underreporting is a problem in a given country?

2. Validity of production/trade data. Ecological measures of consumption in a country are based on production or trade data. The United Nations Commodity Trade Statistics Database (UN Comtrade) (United Nations, 2010) and the United Nations Statistical Division's Industrial Commodity Production Statistics Dataset (United Nations, 2011) are thought to be the most dependable and comprehensive datasets available (IARC, 2008). However, data reported by UN Comtrade can differ substantially from other sources, including the U.S. Department of Agriculture (2011) and the Food and Agriculture Organization of the United Nations (FAO, 2011). Reasons for these inaccuracies include: over/underestimates depending on a country's import and export activities; differences in how data are reported (i.e., in weight vs. physical units); within country differences in data reporting (i.e., trade statistics reported in weight, while production statistics are reported in units); and transient and indigenous populations' impacts on consumption (IARC, 2008). Methodological work is needed to help researchers judge the most accurate data source(s) for their needs (IARC, 2008). Could production/trade data be used to better understand impacts of interventions? Would governments need to mandate the provision of such data? Under what conditions would it would be reasonable to mandate such disclosures?

3. Measuring industry activities. There is a strong need for research to strengthen the validity of measures of tobacco industry activities (Cruz, 2009; Giovino et al., 2009; Reddy et al., 2011). A recent report from a workshop on surveillance in the United States rated as the highest research priority the need to develop systems to better monitor industry activities (Cruz, 2009; Giovino et al., 2009). Results of monitoring should be assembled into a global clearinghouse for information on industry promotion strategies and their efforts to undermine effective tobacco control (Cruz, 2009; Giovino et al., 2009; Gonzalez, Green, & Glantz, 2011; WHO, 2008a).

4. Sampling issues. There are needs for research on sampling to assess the most cost-effective designs that provide valid data. For school surveys, for example, the most cost-efficient sample allocation among stages comes from having data on components of sampling error associated with sampling schools and students within schools, on the average cost of adding another school to the sample, and on the average cost of including another student respondent to the overall sample of students (Cochran, 1977). These items may be extracted from earlier survey waves or from a survey conducted in a comparable country setting. Similar data needs exist for adult surveys (e.g., considering sampling units, households, and the number of respondents in each household).

5. There is also a need to consider sentinel surveillance, given the costs and other challenges involved in obtaining representative sampling in many places. These designs can also facilitate more rapid response to emerging information needs. This is especially true when the primary objective is to evaluate policies and not to obtain representative estimates of the prevalence of tobacco use behaviors. Although comparisons of sex- and age-specific prevalence estimates obtained using modified sampling strategies with the GATS standard sampling strategy could be informative.

6. Differences in estimates across surveys. There is a need to assess the nature and extent of possible differences in estimates of various tobacco use behaviors and factors influencing use across surveys (e.g., Fidler et al., 2011; Giovino et al., 2012; Hammond, 2009; Jha, Ranson, Nguyen, & Yach, 2002; Pampel, 2008). Comparisons should take into account multiple factors that influence population-based estimates, such as definition of a user, sample frame, type of survey, and editing procedures (IARC, 2008). Sex- and age-specific analyses of key indicators, especially daily and nondaily use, should be compared.

7. Differences in data collection strategies. As efficiencies in data collection strategies evolve, studies of possible differences in estimates provided by face-to-face, telephone, and online data collection strategies are needed. This need is more relevant in high-income countries, where telephone and Internet coverage would be sufficiently high to conduct such work. A split-sample technique (e.g., CDC, 1994) could compare sex- and age-specific estimates of key tobacco use indicators in random samples.

8. Differences in obtaining cooperation. In some countries, respondents may feel compelled to participate when asked. In others, participation rates will be substantially lower as people feel more comfortable refusing participation. Among the 14 GATS Wave I countries, response rates ranged from 65.1% in Poland and 76.1% in Ukraine to 97.2% in Egypt and 97.7% in Russia (Giovino et al., 2012). When people feel compelled to participate, do they feel more compelled to provide socially acceptable answers? How might differing participation rates influence prevalence estimates?

9. Comparability across languages/cultures. Writing questionnaires for different languages and cultures that permit accurate comparisons can be challenging (IARC, 2008). This can be especially true for measures of attitudes and opinions. Research could assess the extent of potential language and/or cultural influences on estimates obtained in several countries.

10. Internet surveillance. The Internet provides a channel for protobacco and antitobacco marketing (Ribisl, 2003; Tobacco Commons Blog, 2011; Trinkets & Trash, 2011), independent portrayals of use (e.g., Bromberg, Augustson, & Backinger, 2011; Hua, Yip, & Talbot, 2011), less expensive purchasing opportunities (e.g., Ayers, Ribisl, & Brownstein, 2011), cessation programming (e.g., Shahab & McEwen, 2009), and other relevant phenomena. Efficient methods to systematically monitor use should be developed and circulated to help countries understand the relevance of exposures to their populations. More research is needed to understand who uses various channels and how such messages influence tobacco-related perceptions, intentions, and motivations.

11. Special populations. There is a need for surveys of special populations, such as health care providers (Tong, Strouse, Hall, Kovac, & Schroeder, 2010), indigenous populations (e.g., Baker et al., 2006; U.S. Department of Health and Human Services [USDHHS], 1998), and lower socioeconomic status populations (Hiscock, Bauld, Amos, Fidler, & Munafo, 2011), as the use of surveillance can facilitate the evaluation of interventions. Methodological work will be needed on the development of optimal sample frames and questionnaire content. In countries where use is very low among women, research studies could explore patterns and factors influencing use among those women who use despite countervailing cultural norms.

12. An ad-hoc study group on alternative crops was established by the WHO to examine economically feasible alternatives to tobacco production, the long-term impact of tobacco companies' practices, and reporting initiatives undertaken in keeping with Article 17. The group also made suggestions regarding worthwhile diversification initiatives. As global tobacco production is moving toward low-income countries, additional studies are needed on the consequences of health, the environment, and social structures in developing regions and countries with transitioning economies. Peer-reviewed studies are needed to collect standardized data on sustainable alternative crops, industry growing practices, employment issues, and public policies. Farmers' awareness of the negative health and environmental impacts of tobacco growing may help them to more readily pursue other ventures, and it is imperative to assess relevant knowledge, attitudes, and behaviors (WHO, 2008c).

To fill all of these knowledge gaps, collaboration will be required from professionals in a number of capacities, including survey methodologists, psychologists, behavioral epidemiologists, economists, researchers who conduct secondary data analysis, and those at the CDC and WHO who are working to address country-specific needs. FCTC Article 22 is about knowledge transfer and capacity building within the parties and will be discussed next.

COLLABORATION AMONG ORGANIZATIONS AND THE PARTIES

Relevant History of Collaboration

WHO has established multiple networks to address tobacco use, including the UN Ad Hoc Interagency Task Force on Tobacco Control (WHO, 2012d), WHO Collaborating Centres on Tobacco Control (WHO, 2012e), WHO Study Group on Tobacco Product Regulation (TobReg; WHO, 2012g), WHO Tobacco Laboratory Network (TobLabNet; WHO, 2012h), and the Tobacco Control Directory (WHO, 2012c). Substantial support for international tobacco control activities is provided by the Bloomberg Initiative to Reduce Tobacco Use (WHO, 2012b), which is implemented through five partner organizations: the Campaign for Tobacco-Free Kids, the CDC Foundation, the Johns Hopkins Bloomberg School of Public Health, WHO Tobacco-Free Initiative, and the World Lung Foundation. The Bill & Melinda Gates Foundation (2011) is working to prevent tobacco use in high-burden countries and in Africa and to expand the science-base for tobacco control.

In addition, multiple networks have been established to foster communication and collaboration on how to implement the FCTC. For example, the Conference of Parties (COP) is a network that comprises representatives of countries and organizations that meet every 2 years to assure FCTC implementation. This network essentially works together to develop agreement on the specific implementation language of the Articles, including specific objectives and outcomes. At the same time, the FCA is a network that primarily comprises civil society organizations that likewise strive to foster implementation of the FCTC Articles via nongovernmental action and vision.

Optimal collaboration among these and other organizations will facilitate progress in controlling the tobacco epidemic.

There exist no "off the shelf" methods that have been shown to assure the most effective collaboration, communication, and coordination needed to achieve optimal dissemination and implementation of research into practice within a network. Some government agencies, such as the USDHHS have created organizations and mechanisms to foster synthesis and interpretation of research into regulation (e.g., U.S. Food and Drug Administration mechanisms for reviewing claims) and practice (e.g., U.S. tobacco treatment guidelines process, Fiore et al., 2008). However, fostering communication and collaboration between agencies responsible for effective tobacco control are not regulated and, at least in some cases, could be improved (Leischow et al., 2010).

What Is Known About Collaboration

Collaborative networks (often called coalitions) of individuals and organizations working on a common goal have been the foundation for fostering change in public health policies (National Cancer Institute [NCI], 2005). Some of the more famous examples include the movement to prohibit alcohol use in the early part of the last century; the implementation of comprehensive heart disease prevention efforts in North Karelia, Finland, in the middle of the last century; and efforts to increase awareness of and to support more funding for HIV/AIDS in the 1980s (NCI, 2007). In tobacco control, collaborative efforts to win passage of, and to implement, the FCTC represent the greatest global tobacco control accomplishments by far. Hundreds of organizations—including government, civil society, and corporations—worked together to fashion global policies that have the goal of dramatically reducing tobacco use and tobacco-caused disease. And now that 174 countries have ratified the FCTC, networks (i.e., coalitions or alliances) are actively working to develop specific implementation language and providing guidance to country and region-specific implementation.

There is considerable linkage between the COP and FCA, as well as with many organizations outside of the COP and FCA formally (e.g., nontobacco corporations), but how these networks function together to achieve the greatest public health gains is unclear. More specifically, even though evidence-based decision making is at the heart of strategies for implementing Articles (e.g., on taxation, smoke-free environments, tobacco treatment), it appears that evidence-based approaches to fostering effective networks for knowledge management, dissemination, and implementation are not being employed.

By working together as a federation or "network of networks" (Leischow et al., 2008; Mason & Watts, 2012), organizations can improve both their efficiency and the effectiveness of the services and programs they offer (Agranoff & McGuire, 2003; O'Toole, 1997). Potential benefits of network involvement for tobacco control are substantial, and include improved services, better access to these services by clients, less duplication of effort, better communication and access to needed information, improved innovation, and ultimately, improved health status indicators (NCI, 2007). Networks have been shown to be especially valuable for nongovernmental organizations and public organizations working to address a broad range of problems in communities and regional health and human services (cf., Alter & Hage, 1993; Provan & Milward, 2001).

Perhaps in part because the rate of knowledge acquisition has far surpassed our ability to effectively synthesize and implement it into practice, the public health community has begun to use network and system science to improve how we understand and optimize public health practice (Borland, Young, Coghill, & Zhang, 2010; de Savigny & Adam, 2009; Leischow et al., 2008, 2010; NCI, 2007). However, because knowledge on the processes of moving discovery to delivery are not well known, considerable research is needed to further explicate those processes (Leischow et al., 2008; Stokols, Hall, Taylor, & Moser, 2008). Recent research has demonstrated that social networks impact a variety of health behaviors, including obesity (Christakis & Fowler, 2007), tobacco control (Christakis & Fowler, 2008; Leischow et al., 2008, 2010; Luke & Harris, 2007), and HIV/AIDS (Kohler, Behrman, & Watkins, 2007). In addition, there is increased research demonstrating that social and organizational networks influence the diffusion of innovations relevant to the implementation of evidence-based practices (Valente, 2010) and that social network data can improve organizational functioning (Valente, 2012). For example, recent research exploring the role of network interactions on dissemination and implementation of evidence-based practices among smoking cessation quitlines is illustrative of what is possible with respect to global tobacco control. Research on this quitline network demonstrated that the awareness of which practices were evidence based was more likely when the funders of those quitlines have strong direct connections to researchers (Provan, Beagles, Leischow, & Mercken, 2013), and that quitlines' unilateral decision making (e.g., by a funder) on whether to adopt a practice were less likely to adopt treatment practices than organizations where adoption was determined through consensus processes involving funders and providers (Bonito, Ruppel, Saul, & Leischow, 2012). Government efforts, such as the "science of team science" initiative at the U.S. National Cancer Institute further reflect the increased interest in network methods to improve the adoption and implementation of evidence-based practices (NCI, 2008).

Research Opportunities to Inform Collaboration

Given the complexity of implementing the FCTC Articles in a way that takes maximum advantage of generalizable information, as well as knowledge that is unique to a country or region, new research is needed to characterize the structure of network relationships (e.g., regional roles, key opinion leaders, central organizational influences) on the adoption and implementation of policies and practices, and in particular how and by whom decisions are made to implement those policies and practices.

13. Understanding the structure and function of the global network of tobacco control organizations dedicated to implementing the FCTC Articles. What does the network of organizations involved in the FCTC implementation look like? Which organizations are communicating and collaborating with each other on implementation, at what frequency and for what reason? Are some organizations or individuals more or less influential with respect to diffusion, adoption, and implementation? How is the network changing over time as new knowledge and relationships evolve, and as different components of the FCTC become implemented? Are there regional differences in diffusion

and implementation, and are there influential countries, organizations, or individuals within regions that have the potential to benefit other countries within that region? Many of these questions can be assessed through common survey and interview methods that can together characterize network structure and function.

14. Characterizing the countervailing networks (tobacco companies and their partners) striving to undermine the implementation of the FCTC. How are tobacco industries, and partners including governments, in some cases, collaborating in order to adapt to the FCTC implementation? How can tobacco industry methods be tracked and shared globally in order to create a "shared situational awareness" of their activities, thus allowing for greater ability to prevent or counter their efforts? Sophisticated data mining of Internet activity, such as that used to assess the "dark web" used by terrorist organizations, has the potential to assess some of these questions (Chen, 2012).

15. Analysis of the network/relationship factors that impact diffusion of knowledge and decision making on implementation of the FCTC. As countries implement different Articles, what is the impact on networks within country and region that might strengthen or weaken implementation of other Articles? What organizational roles foster cooperation and knowledge exchange, and are there barriers to cooperation and collaboration that can be identified and ultimately improved upon? Analysis of organizational networks as well as contextual factors can be used effectively to characterize decision-making processes (Bonito et al., 2012).

16. What are the infrastructure needs for assuring optimal communication and collaboration for FCTC implementation? How can local experiences be effectively collected and shared with stakeholders so that it can be best used? What informatics infrastructures are needed to assure that knowledge can be effectively shared globally? What knowledge management infrastructures do members of the tobacco control community use for sharing information effectively, and, if those infrastructures do not exist (or perhaps are not adequate for a particular Article or domain), how can members of the community help to foster such infrastructures? The U.S. National Cancer Institute developed a full monograph on methods to assess and optimize complex systems for improving tobacco control (NCI, 2007).

CONCLUSIONS

Taking advantage of each of the 16 research opportunities discussed above would facilitate progress in tobacco control—optimizing measurement will facilitate change (Backinger & Malarcher, 2010; Giovino et al., 2009). We believe, however, that six areas would be particularly wise investments. For example, if validation studies indicate that smoking among women is more of a problem that previously thought in several countries, then programs and policies should be implemented to better prevent initiation and promote quitting among women (Opportunity 1). Proper monitoring of industry activities (Opportunity 3) and the networks used by the industry and its partners (Opportunity 14) would better inform strategies to neutralize industry influence, the Vector of disease. Improving sampling (Opportunities 4 and 5) would make survey work

more efficient, thus freeing resources for other needs. In many parts of the world, the lack of a network of tobacco control workers to share information, data, and best practices hinders progress (Baris et al., 2000). Analyses of network relationships (Opportunity 15) should facilitate cooperation and ultimately more effective control of the tobacco epidemic.

We also believe that a review of the surveillance systems is needed to optimize resource utilization. While GATS and surveys employing the *TQS* are designed to monitor prevalence and trends over time in a serial cross-sectional design, the ITC design utilizes cohorts to more efficiently evaluate FCTC policies. Discussion of coordinated surveillance and evaluation strategies in a collaborative manner is needed. Topics for discussion would include the optimal timing of surveys, the most important questions to include on surveys, and guidelines for the proper mix of cross-sectional and cohort designs. Such a process would contribute to optimal implementation of Articles 20–22 and improve the public's health.

DECLARATION OF INTERESTS

None declared.

REFERENCES

Agranoff, R., & McGuire, M. (2003). *Collaborative public management: New strategies for local governments*. Washington, DC: Georgetown University Press.

Alter, C., & Hage, J. (1993). *Organizations working together*. Newbury Park, CA: Sage.

Ayers, J. W., Ribisl, K., & Brownstein, J. S. (2011). Using search query surveillance to monitor tax avoidance and smoking cessation following the United States' 2009 "SCHIP" cigarette tax Increase. *PLoS One*, *6*, e16777. doi:10.1371/journal.pone.0016777

Backinger, C. L., & Malarcher, A. M. (2010). The things that get measured are the things that get done. *American Journal of Preventive Medicine*, *38*, S433–S436. doi:10.1016/j.amepre.2009.12.005

Baker, A., Ivers, R. G., Bowman, J., Butler, T., Kay-Lambkin, F. J., Wye, P., . . . Wodak, A. (2006). Where there's smoke, there's fire: High prevalence of smoking among some sub-populations and recommendations for intervention. *Drug and Alcohol Review*, *25*, 85–96. doi:10.1080/09595230500459552

Baris, E., Brigden, L. W., Prindiville, J., da Costa e Silva, V. L., Chitanondh, H., & Chandiwana, S. (2000). Research priorities for tobacco control in developing countries: A regional approach to a global consultative process. *Tobacco Control*, *9*, 217–223. doi:10.1136/tc.9.2.217

Barnea, Z., Rahav, G., & Teichman, M. (1987). The reliability and consistency of self-reports on substance use in a longitudinal study. *British Journal of Addiction*, *82*, 891–898.

Biemer, P. P. (2010). Total survey error: Design, implementation, and evaluation. *Public Opinion Quarterly*, *74*, 817–848.

Bill & Melinda Gates Foundation. (2011). Tobacco overview. Retrieved from www.gatesfoundation.org/topics/Pages/tobacco.aspx

Bogen, K., Biener, L., Garrett, C. A., Allen, J., Cummings, K. M., Hartman, A., … Pederson, L. (2009). Surveillance indicators for potential reduced exposure products (PREPs): Developing survey items to measure awareness. *Harm Reduction Journal*, *6*, 27–35. doi:10.1186/1477-7517-6-27

Bonito, J., Ruppel, E., Saul, J., & Leischow, S. J. (2012). Assessing the preconditions for communication influence on organizational decision making: The North American quitline consortium. *Health Communications*. Advance online publication. doi:10.1080/10410236.2012.673245

Bonnie, R. J., Stratton, K., & Wallace, R. B. (Eds.). (2007). *Ending the tobacco problem. A blueprint for the nation*. Washington, DC: National Academy of Sciences, Institute of Medicine, National Academies Press.

Borek, N. (2012). Population Assessment of Tobacco and Health – the PATH Study. Retrieved from www.fda.gov/downloads/TobaccoProducts/NewsEvents/UCM324243.pdf

Borland, R., Cooper, J., McNeill, A., O'Connor, R., & Cummings, K. M. (2011a). Trends in beliefs about the harmfulness and use of stop-smoking medications and smokeless tobacco products among cigarette smokers: Findings from the ITC four-country survey. *Harm Reduction Journal*, *8*, 21–32. doi:10.0086/1477-7517-8-21.

Borland, R., Partos, T. R., Yong, H. H., Cummings, K. M., & Hyland, A. (2011b). How much unsuccessful quitting activity is going on among adult smokers? Data from the International Tobacco Control 4-Country cohort survey. *Addiction* [postprint]. doi:10.1111/j.1360-0443.2011.03685.x

Borland, R., Young, D., Coghill, K., & Zhang, J. Y. (2010). The tobacco use management system: Analyzing tobacco control from a systems perspective. *American Journal of Public Health*, *100*, 1229–1236. doi:10.2105/AJPH.2009.165910

Bostic, C. (Ed.). (2012). Tobacco watch. Monitoring countries' performance on the global treaty. Geneva, Switzerland: Framework Convention Alliance. Retrieved from www.fctc.org/images/stories/Tobacco_Watch_2012_ENG.pdf

Bradburn, N., Sudman, S., & Wansink, B. (2004). *Asking questions: The definitive guide to questionnaire design* (Rev. ed.). New York, NY: Jossey-Bass.

Brigham, J., Lessov-Schlaggar, C. N., Javitz, H. S., McElroy, M., Krasnow, R., & Swan, G. E. (2008). Reliability of adult retrospective recall of lifetime tobacco use. *Nicotine & Tobacco Research*, *10*, 287–299. doi:10.1080/14622200701825718

Bromberg, J. E., Augustson, E. M., & Backinger C. L. (2011). Portrayal of smokeless tobacco in YouTube videos. *Nicotine & Tobacco Research*. doi:10.1093/ntr/ntr235

Brownson, R. C., Baker, E. A., Leet, T. L., Gillespie, K. N., & True, W. R. (2011). *Evidence-based public health* (2nd ed.). New York, NY: Oxford University Press.

Caraballo, R. S., Giovino, G. A., & Pechacek, T. F. (2004). Self-reported cigarette smoking vs. serum cotinine among U.S. adolescents. *Nicotine & Tobacco Research*, *6*, 19–25.

Caraballo, R. S., Giovino, G. A., Pechacek, T. F., & Mowery, P. D. (2001). Factors associated with discrepancies between self-reports on cigarette smoking and measured serum cotinine levels among persons aged 17 years or older: Third National Health and Nutrition Examination Survey, 1988-1994. *American Journal of Epidemiology*, *153*, 807–814.

Caraballo, R. S., Holiday, D. B., Stellman, S. D., Mowery, P. D., Giovino, G. A., Muscat, J. E., … Kozlowski, L. T. (2011). Comparison of serum cotinine concentration within and across smokers of menthol and nonmenthol cigarette brands among non-Hispanic black and non-Hispanic white U.S. adult smokers, 2001–2006. *Cancer Epidemiology, Biomarkers, and Prevention*, *20*, 1329–1340. doi:10.1158/1055-9965.EPI-10-1330

Centers for Disease Control and Prevention (CDC). (1994). Cigarette smoking among adults -- United States, 1992, and changes in the definition of current cigarette smoking. *MMWR*, *43*, 342–346.

CDC. (2001). Updated guidelines for evaluating public health surveillance systems. Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm

CDC. (2006). Use of cigarettes and other tobacco products among students aged 13–15 years - worldwide, 1999–2005. *MMWR*, *55*, 553–556. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/mm5520a2.htm

CDC. (2007). Exposure to secondhand smoke among students aged 13–15 years – worldwide 2000–2007. *MMWR*, *56*, 497–500. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/mm5620a2.htm

CDC. (2011a). Smoking and tobacco use: About GTSS. Retrieved from www.cdc.gov/tobacco/global/gtss/

CDC. (2011b). Cigarette package health warnings and interest in quitting smoking--14 countries, 2008–2010. *MMWR*, *60*, 645–651. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/mm6020a2.htm

CDC. (2012a). Global Tobacco Surveillance System (GTSSData) Country Reports. Retrieved from http://apps.nccd.cdc.gov/gtssdata/Ancillary/DataReports.aspx?CAID=3

CDC. (2012b). Global Tobacco Surveillance System (GTSSData) Fact Sheets. Retrieved from http://apps.nccd.cdc.gov/gtssdata/Ancillary/DataReports.aspx?CAID=1

CDC. (2012c). Global Tobacco Surveillance System (GTSSData) Publications. Retrieved from http://apps.nccd.cdc.gov/gtssdata/Ancillary/Publications.aspx

CDC. (2012d). Global Tobacco Surveillance System (GTSSData) Datasets. Retrieved from http://apps.nccd.cdc.gov/gtssdata/Ancillary/DataReports.aspx?CAID=2

CDC. (2012e). Global Tobacco Surveillance System (GTSSData) Documentation/Resources. Retrieved from http://apps.nccd.cdc.gov/gtssdata/Ancillary/Documentation.aspx?SUID=1&DOCT=1

CDC. (2012f). Awareness of tobacco advertising, promotion & sponsorship--14 countries. *MMWR*, *61*, 365–369. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/mm6120a2.htm

Chaloupka, F., Hu, T. W., Warner, K. E., Jacobs, R., & Yurekli, A. (2000). The taxation of tobacco products. In P. Jha & F. K.

Chaloupka (Eds.), *Tobacco control in developing countries* (pp. 237–272). Oxford: Oxford University Press.

Chen, H. (2012). *Dark web: Exploring and data mining the dark side of the web (integrated series in information systems)*. New York, NY: Springer. doi:10.1007/978-1-4614-1557-2

Choi, W. S., Gilpin, E. A., Farkas, A. J., & Pierce, J. P. (2001). Determining the probability of future smoking among adolescents. *Addiction*, *96*, 313–323.

Christakis, N. A., & Fowler, J. H. (2007). The spread of obesity in a large social network over 32 years. *New England Journal of Medicine*, *357*, 370–379. doi:10.1056/NEJMsa066082

Christakis, N. A., & Fowler, J. H. (2008). The collective dynamics of smoking in a large social network. *New England Journal of Medicine*, *358*, 2249–2258. doi:10.1056/NEJMsa0706154

Cochran, W. G. (1977). *Sampling techniques*. New York, NY: John Wiley & Sons.

Coffman, J. (2002). *Public communication campaign evaluation: An environmental scan of challenges, criticisms, practice, and opportunities*. Cambridge: Harvard Family Research Project.

Cruz, T. B. (2009). Monitoring the tobacco use epidemic IV. The vector: Tobacco industry data sources and recommendations for research and evaluation. *Preventive Medicine*, *48*(1 Suppl.), S24–S34. doi:S0091-7435(08)00513-6

Delnevo, C. D., & Bauer, U. E. (2009). Monitoring the tobacco use epidemic III. The host: Data sources and methodological challenges. *Preventive Medicine*, *48*(1 Suppl.), S16–S23. doi:S0091-7435(08)00506-9

de Savigny, D., & Adam, T. (Eds.). (2009). *Systems thinking for health systems strengthening*. Geneva, Switzerland: Alliance for Health Policy and Systems Research, World Health Organization.

de Savigny, D., & Adam, T. (Eds.). (2009). *Systems thinking for health systems strengthening*. Geneva, Switzerland: Alliance for Health Policy and Systems Research, World Health Organization.

FAO. (2011). Food and Agriculture Organization of the United Nations. Retrieved from http://faostat.fao.org/default.aspx

Farrelly, M. C. (2009). Monitoring the tobacco use epidemic V. The environment: Factors that influence tobacco use. *Preventive Medicine*, *48*(1 Suppl.), S35–S43. doi:S0091-7435(08)00517-3

Fidler, J. A., Shahab, L., West, O., Jarvis, M. J., McEwen, A., Stapleton, J. A., … West, R. (2011). 'The Smoking Toolkit Study': A national study of smoking and smoking cessation in England. *BMC Public Health*, *11*, 479. Retrieved from www.biomedcentral.com/1471–2458/11/479

Fiore, M. C., Jaén, C. R., Baker, T. B., Bailey, W. C., Benowitz, N. L., Curry, S. J., . . . Wewers, M. E. (2008, May). *Treating tobacco use and dependence: 2008 update. Clinical practice guideline*. Rockville, MD: U.S. Department of Health and Human Services.

Fong, G. T. (2011). International tobacco control policy evaluation project (ITC). Retrieved from http://arts.uwaterloo.ca/~gfong/itcproject.htm

Fong, G. T., Cummings, K. M., Borland, R., Hastings, G., Hyland, A., Giovino, G. A., … Thompson, M. E. (2006). The conceptual framework of the International Tobacco Control (ITC) Policy Evaluation Project. *Tobacco Control*, *15*(Suppl. III), iii3–iii11. doi:10.1136/tc.2005.015438

Fong, G. T., Hyland, A., Borland, R., Hammond, D., Hastings, G., McNeill, A., … Driezen, P. (2006). Reductions in tobacco smoke pollution and increases in support for smoke-free public places following the implementation of comprehensive smoke-free workplace legislation in the Republic of Ireland: Findings from the ITC Ireland/UK Survey. *Tobacco Control*, *15*(Suppl. 3), iii51–iii58. doi:10.1136/tc.2005.013649

Giovino, G. A. (2000). World's best practice in tobacco control. Surveillance of patterns and consequences of tobacco use: USA. *Tobacco Control*, *9*, 232–233.

Giovino, G. A., Biener, L., Hartman, A. M., Marcus, S. E., Schooley, M. W., Pechacek, T. F., & Vallone, D. (2009). Monitoring the tobacco use epidemic I. Overview: Optimizing measurement to facilitate change. *Preventive Medicine*, *48*(1 Suppl.), S4–S10. doi:S0091-7435(08)00454-4

Giovino, G. A., Mirza, S. A., Samet, J. M., Gupta, P. C., Jarvis, J. J., Bhala, N., . . . Asma, S.; for the GATS Collaborative Group. (2012). Tobacco use in 3 billion individuals from 16 countries: An analysis of nationally representative cross-sectional household surveys. *Lancet*, *380*, 668–679. doi:10.1016/S0140-6736(12)61085-X

Global Adult Tobacco Survey (GATS) Collaborative Group. (2011a). *Tobacco questions for surveys: A subset of key questions from the global adult tobacco survey (GATS)* (2nd ed.). Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from www.who.int/tobacco/surveillance/en_tfi_tqs.pdf

Gonzalez, M., Green, L. W., & Glantz, S. A. (2011). Through tobacco industry eyes: Civil society and the FCTC process from Philip Morris and British American Tobacco's perspectives. *Tobacco Control*, 1–9. doi:10.1136/tc.2010.041657

Gray, N., & Borland, R. (2012). Research required for the effective implementation of the Framework Convention for Tobacco Control, Article 9 and 10. *Nicotine & Tobacco Research*. Advance online publication. doi:10.1093/ntr/nts175

Groves, R. M., Fowler, F. J., Couper, M., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2004). *Survey methodology*. New York, NY: Wiley-Interscience.

Groves, R. M., & Lyberg, L. (2010). Total survey error: Past, present, and future. *Public Opinion Quarterly*, *74*, 849–879.

Haenszel, W., Shimkin, M. B., & Miller, H. P. (1956). Tobacco smoking patterns in the United States (Public Health Monograph 45, Publication No. (PHS) 463). Washington, DC: U.S. Department of Health, Education, and Welfare; Public Health Service.

Hammond, S. K. (2009). Global patterns of nicotine and tobacco consumption. In J. E. Henningfield, E. D. London, & S. Pogun (Eds.), *Nicotine psychopharmacology* (pp. 3–28). Berlin, Germany: Springer.

Hammond, D., Fong, G. T., McNeill, A., Borland, R., & Cummings, K. M. (2006). Effectiveness of cigarette warning labels in informing smokers about the risks of smoking: Findings from the International Tobacco Control (ITC) Four Country Survey. *Tobacco Control*, *15*(Suppl. 3), iii19–iii25. doi:10.1136/tc.2005.012294

Harris, F., MacKintosh, A. M., Anderson, S., Hastings, G., Borland, R., Fong, G. T., … Cummings, K. M. for the ITC Collaboration Group. (2006). Effects of the 2003 advertising/promotion ban in the United Kingdom on awareness of tobacco marketing: Findings from the International Tobacco Control (ITC) Four Country Survey. *Tobacco Control*, *15*(Suppl. 3), iii26–iii33. doi:10.1136/tc.2005.013110

Hatsukami, D. K., Giovino, G. A., Eissenberg, T., Clark, P. I., Lawrence, D., & Leischow, S. (2005). Methods to assess potential reduced exposure products. *Nicotine & Tobacco Research*, *7*, 827–844. doi:10.1080/14622200500266015

Hiscock, R., Bauld, L., Amos, A., Fidler, J. A., & Munafo, M. (2011). Socioeconomic status and smoking: A review. *Annals of the New York Academy of Sciences*, 1–17. doi:10.1111/j.1749-6632.2011.06202.x

Horvitz, D. G. (1978). Some design issues in sample surveys. In N. K. Namboodiri (Ed.), *Survey sampling and measurement* (pp. 3–11). New York, NY: Academic Press.

Hua, M., Yip, H., & Talbot, P. (2011). Mining data on the use of electronic nicotine delivery systems (ENDS) from YouTube videos. *Tobacco Control*. doi:10.1136/tobaccocontrol-2011-050226

Hyland, A., Laux, F. L., Higbee, C., Hastings, G., Ross, H., Chaloupka, F. J., … Cummings, K. M. (2006). Cigarette purchase patterns in four countries and the relationship with cessation: Findings from the International Tobacco Control (ITC) Four Country Survey. *Tobacco Control*, *15*(Suppl. 3), iii59–iii64. doi:1 0.1136/tc.2005.012203

International Agency for Research on Cancer. (2008). *Methods for evaluating tobacco control policies. IARC handbooks of cancer prevention: Tobacco control* (*Vol. 12*). Lyon, France: Author.

International Tobacco Control Policy Evaluation Project (ITC Project). (2011a). Key findings. Retrieved from www.itcproject.org/key_findings

ITC Project. (2011b). Countries. Retrieved from www.itcproject.org/countries

ITC Project. (2011c). Research methods. Retrieved from www.itcproject.org/research_methods

ITC Project. (2011d). Data request processes. Retrieved from www.itcproject.org/datarequ

ITC Project. (2011e). Surveys. Retrieved from www.itcproject.org/surveys

Jarvis, M. J., Boreham, R., Primatesta, P., Feyerabend, C., & Bryant, A. (2001). Nicotine yield from machine-smoked cigarettes and nicotine intakes in smokers: Evidence from a representative population survey. *Journal of the National Cancer Institute*, *93*, 134–138.

Jarvis, M. J., Fidler, J., Mindell, J., Feyerabend, C., & West, R. (2008). Assessing smoking status in children, adolescents and adults: Cotinine cut-points revisited. *Addiction*, *103*, 1553–1561. doi:10.1111/j.1360-0443.2008.02297.x

Jarvis, M. J., Sims, M., Gilmore, A., & Mindell, J. (2012). Impact of smoke-free legislation on children's exposure to secondhand smoke: Cotinine data from the Health Survey for England. *Tobacco Control*, *21*, 18–23. doi:10.1136/tc.2010.041608

Jha, P., & Chaloupka, F. J. (1999). *Curbing the epidemic: Governments and the economics of tobacco control*. Washington, DC: World Bank.

Jha, P., Chaloupka, F., Moore, J., Gajalakshmi, V., Gupta, P. C., Peck, R., . . . Zatonski, W. (2006). Tobacco addiction. In D. T. Jamison, J. G. Breman, A. R. Measham, G. Alleyne, M. Claeson, D. B. Evans, … P. Musgrove (Eds.), *Disease control priorities in developing countries* (pp. 869–885). Washington, DC: The International Bank for Reconstruction and Development, World Bank.

Jha, P., Ranson, M. K., Nguyen, S. N., & Yach, D. (2002). Estimates of global and regional smoking prevalence in 1995, by age and sex. *American Journal of Public Health*, *92*, 1002–1006. doi:10.2105/AJPH.92.6.1002

Jung-Choi, K. H., Khang, Y. H., & Cho, H. J. (2011). Hidden female smokers in Asia: A comparison of self-reported with cotinine-verified smoking prevalence rates in representative national data from an Asian population. *Tobacco Control*, *21*(6), 536–542. doi:10.1136/tobaccocontrol-2011-050012

Kasza, K. A., Hyland A. J., Borland, R., McNeill, A. D., Bansal-Travers, M., Fix, B. V., . . . Cummings, K. M. (2013). Effectiveness of stop-smoking medications: Findings from the International Tobacco Control (ITC) Four Country Survey. *Addiction*, *108*(1), 193–202. doi:10.1111/j.1360-0443.2012.04009.x

King, B., Mirza, S., & Babb, S; for the GATS Collaborating Group. (2012). A cross-country comparison of secondhand smoke exposure among adults: Findings from the Global Adult Tobacco Survey (GATS). *Tobacco Control*. Advance online publication. doi:10.1136/tobaccocontrol-2012-050582

Kish, L. (1965). *Survey sampling*. New York, NY: John Wiley & Sons.

Kohler, H. P., Behrman, J. R., & Watkins, S. C. (2007). Social networks and HIV/AIDs risk perceptions. *Demography*, *44*, 1–33.

Koplan J. P., & Mackay, J. (2012). Curtailing tobacco use: First we need to know the numbers. *Lancet*, *380*, 678–679. doi:10.1016/S0140-6736(12)61307-5

Kostova, D., Chaloupka, F. J., Yurekli, A., Ross, H., Cherukupalli, R., Andes, L., & Asma, S.; on behalf of the GATS Collaborative Group. (2012). A cross-country study of cigarette prices & affordability: Evidence from the Global Adult Tobacco Survey. *Tobacco Control*. Advance online publication. doi:10.1136/tobaccocontrol-2011-050413

Laatikainen, T., Vartiainen, E., & Puska, P. (1999). Comparing smoking and smoking cessation process in the Republic of Karelia, Russia and North Karelia, Finland. *Journal of Epidemiology and Community Health*, *53*, 528–534.

Leischow, S., Best, A., Trochim, W., Clark, P., Gallagher, R., Marcus, S., & Matthews, E. (2008). Systems thinking to improve the public's health. *American Journal of Preventive Medicine*, *35*, S196–S210. doi:10.1016/j.amepre.2008.05.014

Leischow, S. J., Luke, D. A., Mueller, N., Harris, J. K., Ponder, P., Marcus, S., & Clark, P. I. (2010). Mapping U.S. government tobacco control leadership: Networked for success? *Nicotine and Tobacco Research*, *12*, 888–894. doi:10.1093/ntr/ntq112

Lessler, J. T., & Kalsbeek, W. D. (1992). *Nonsampling errors in surveys*. New York, NY: Wiley.

Li, L., Yong, H. H., Borland, R., Fong, G. T., Thompson, M. E., Jiang, Y., … Harris, F. (2009). Reported awareness of tobacco advertising and promotion in China compared to Thailand, Australia, and the USA. *Tobacco Control*, *18*, 222–227. doi:1 0.1136/tc.2008.027037

Lohr, S. (2010). *Sampling: Design and analysis* (*2nd ed.*). Pacific Grove, CA: Duxbury Press.

Luke, D. A., & Harris, J. K. (2007). Network analysis in public health: History, methods, and applications. *Annual Review of Public Health*, *28*, 69–93. doi:10.1146/annurev.publhealth.28.021406.144132

Mason, W., & Watts, D. J. (2012). Collaborative learning in networks. *Proceedings of the National Academy of Sciences of the United States of America*, *109*, 764–769. doi:10.1073/pnas.1110069108

National Cancer Institute (NCI). (2005). ASSIST: Shaping the future of tobacco prevention and control (Tobacco Control Monograph No. 16, NIH Pub. No. 05-5645). Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute. Retrieved from www.tobaccopreventionandcontrol.ncdhhs.gov/pubs/Documents/m16_complete.pdf

NCI. (2007). Greater than the sum: Systems thinking in tobacco control [Tobacco Control Monograph No. 18, NIH Pub. No. 06-6085]. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute.

NCI. (2008). Science of team science. Retrieved from http://cancercontrol.cancer.gov/brp/scienceteam/index.html

O'Connor, R. J. (2011). Postmarketing surveillance for "modified-risk" tobacco products. *Nicotine and Tobacco Research*, 1–14. doi:10.1093/ntr/ntq243

O'Connor, R. J., Cummings, K. M., Rees, V. W., Connolly, G. N., Norton, K. J., Sweanor, D., Parascandola, M., … Shields, P. G. (2009). Surveillance methods for identifying, characterizing, and monitoring tobacco products:

Potential reduced exposure products as an example. *Cancer Epidemiology, Biomarkers, and Prevention*, *18*, 3334–3348. doi:10.1158/1055-9965.EPI-09-0429

O'Toole, L. J., Jr. (1997). Treating networks seriously: Practical and research-based agendas in public administration. *Public Administration Review*, *57*, 45–52.

Palipudi, K. M.,Gupta, P. C., Sinha, D. N., Andes, L. J., Asma, S., & McAfee, T. for the GATS Collaborative Group. (2012). Social determinants of health and tobacco use in thirteen low & middle income countries: Evidence from Global Adult Tobacco Survey. *PLos One*, *7*, e33466. doi:10.1371/journal.pone.0033466

Pampel, F. (2008). Tobacco use in sub-Sahara Africa: Estimates from the demographic health surveys. *Social Science and Medicine*, *66*, 1772–1783. doi:10.1016/j.socscimed.2007.12.003

Patrick, D. L., Cheadle, A., Thompson, D. C., Diehr, P., Koepsell, T., & Kinne, S. (1994). The validity of self-reported smoking: A review and meta-analysis. *American Journal of Public Health*, *84*, 1086–1093.

Pickett, M. S., Schober, S. E., Brody, D. J., Curtin, L. R., & Giovino, G. A. (2006). Smoke-free laws and second-hand smoke exposure in US non-smoking adults, 1999–2002. *Tobacco Control*, *15*(4), 302–307. doi: 10.1136/tc.2005.015073

Provan, K. G., Beagles, J., Leischow, S. J., & Mercken, L. (2013). Awareness of evidence-based practices by organizations in a smoking cessation network. *Journal of Public Administration Research and Theory*, *23*(1), 133–153. doi:10.1093/jopart/mus011

Provan, K. G., & Milward, H. B. (2001). Do networks really work? A framework for evaluating public-sector organizational networks. *Public Administration Review*, *61*, 414–423.

Reddy, S. K., Chaloupka, F. J., Arora, M., Panda, R., Mathu, M. R., Samet, J., & Bettcher D. (2011). Research priorities for tobacco control. In *Prioritized research agenda for prevention and control of noncommunicable diseases* (pp. 95–119). World Health Organization. Retrieved from http://whqlibdoc.who.int/publications/2011/9789241564205_CD_eng.pdf

Ribisl, K. M. (2003). The potential of the internet as a medium to encourage and discourage youth tobacco use. *Tobacco Control*, *12*, i148–i159. doi:10.1136/tc.12.suppl_1.i48

Shahab, L., & McEwen, A. (2009). Online support for smoking cessation: A systematic review of the literature. *Addiction*, *104*, 1792–1804.

Sims, M., Mindell, J. S., Jarvis, M. J., Feyerabend, C., Wardle, H., & Gilmore, A. (2012). Did smokefree legislation in England reduce exposure to secondhand smoke among non-smoking adults? Cotinine analysis from the Health Survey for England. *Environmental Health Perspectives*, *120*, 425–430. doi:10.1289/ehp.1103680

Starr, G., Rogers, T., Schooley, M., Porter, S., Wiesen, E., & Jamison, N. (2005). *Key outcome indicators for evaluating comprehensive tobacco control programs*. Atlanta, GA: Centers for Disease Control and Prevention.

Stellman, S. D., & Djordjevic, M. V. (2009). Monitoring the tobacco use epidemic II. The agent: Current and emerging tobacco products. *Preventive Medicine*, *48*(Suppl. 1), S11–S15. doi:S0091-7435(08)00459-3

Stokols, D., Hall, K. L., Taylor, B. K., & Moser, R. P. (2008). The science of team science: Overview of the field and introduction to the supplement. *American Journal of Preventive Medicine*, *35*, S77–S89. doi:10.1016/j.amepre.2008.05.002

Stratton, K., Shetty, P., Wallace, R., & Bondurant, S. (Eds.). (2001). Committee to assess the science base for tobacco harm reduction, Institute of Medicine. In *Clearing the smoke: Assessing the science base for tobacco harm reduction.* (pp. 180–200). Washington, DC: National Academies Press.

Sunley, E., Yurekli, A., & Chaloupka, F. (2000). The design, administration, and potential revenue of tobacco excises. In P. Jha & F. Chaloupka (Eds.), *Tobacco in developing countries*. Oxford: Oxford University Press.

Tobacco Commons Blog. Tobacco commons: Real time marketing tactics abused by big tobacco. Retrieved from http://tobaccocommons.com/

Tong, E. K., Strouse, R., Hall, J., Kovac, M., & Schroeder, S. A. (2010). National survey of U.S. health professionals' smoking prevalence, cessation practices, and beliefs. *Nicotine & Tobacco Research*, *12*, 724–733. doi:10.1093/ntr/ntq071

Tourangeau, R., Rips, L. J., & Rasinski, K. (2000). *The psychology of survey response*. Cambridge, UK: Cambridge University Press.

Trinkets & Trash. (2011). Artifacts of the tobacco epidemic. Retrieved from www.trinketsandtrash.org/

United Nations. (2010). Commodity trade statistics database (COMTRADE). Retrieved from http://comtrade.un.org/

United Nations. (2011). United Nations Statistical Division (UNSD)'s Industrial Commodity Production Statistics Dataset. Retrieved from http://unstats.un.org/unsd/industry/

U.S. Department of Agriculture. (2011, December 6). USDA Foreign Agricultural Service. Retrieved from www.fas.usda.gov/

U.S. Department of Health and Human Services. (1998). *Tobacco use among U.S. racial/ethnic minority groups—African Americans, American Indians and Alaska Natives, Asian Americans and Pacific Islanders, and Hispanics: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Valente, T. W. (2010). *Social networks and health: Models, methods, and applications*. New York, NY: Oxford University Press.

Valente, T. W. (2012). Network interventions. *Science*, *337*, 49–53. doi:10.1126/science.1217330

Vartiainen, E., Seppälä, T., Lillsunde, P., & Puska, P. (2002). Validation of self reported smoking by serum cotinine measurement in a community-based study. *Journal of Epidemiology and Community Health*, *56*, 167–170.

Velicer, W. F., Prochaska, J. O., Rossi, J. S., & Snow, M. G. (1992). Assessing outcome in smoking cessation studies. *Psychological Bulletin*, *111*, 23–41.

Warren, C. W., Asma, S., Lee, J., Lea, V., & Mackay, J. (2009). *Global tobacco surveillance system: The GTSS atlas*. Brighton, UK: Myriad Editions.

Warren, C. W., Jones, N. R., Eriksen, M. P., Asma, S., & Global Tobacco Surveillance System (GTSS) collaborative group. (2006). Patterns of global tobacco use in young people and implications for future chronic disease burden in adults. *Lancet*, *367*, 749–753. doi:10.1016/S0140-6736(06)68192-0

Wegner, M. V., Rohan, A., Remington, P. L. (2010). Chronic disease surveillance, Chapter 4. In P. L. Remington, R. C. Brownson, & M. V. Wegner (Eds.), *Chronic disease epidemiology and control* (3rd ed.). Washington, DC: American Public Health Association.

West, R., Zatonski, W., Przewozniak, K., & Jarvis, M. J. (2007). Can we trust national smoking prevalence figures? Discrepancies between biochemically assessed and self-reported smoking rates in three countries. *Cancer Epidemiology, Biomarkers, and Prevention*, *16*, 820–822.

Wewers, M. E., Dhatt, R. K., Moeschberger, M. L., Guthrie, R. M., Kuun, P., & Chen, M. S. (1995). Misclassification of smoking status among Southeast Asian adult immigrants. *American Journal of Respiratory and Critical Care Medicine*, *152*(6 Pt. 1), 1917–1921.

WHO European working group on health promotion evaluation. (1998). Health promotion evaluation: Recommendations to policymakers. Copenhagen, Denmark: World Health Organization. Retrieved from www.infosihat.gov.my/artikelHP/bahanrujukan/HEandPenilaian/HP%20Evaluation.pdf

World Health Organization (WHO). (1998). Guidelines for controlling and monitoring the tobacco epidemic. Geneva, Switzerland: World Health Organization, Tobacco or Health Programme.

WHO. (2003). WHO framework convention on tobacco control. Geneva, Switzerland: Author [updated 2004, 2005]. Retrieved from www.who.int/tobacco/framework/WHO_FCTC_english.pdf

WHO. (2008a). Tobacco industry interference with tobacco control. Geneva, Switzerland: Author. Retrieved from www.who.int/tobacco/resources/publications/tob_ind_int_cover_150/en/

WHO. (2008b). WHO report on the global tobacco epidemic, 2008 -- The MPOWER package. Geneva, Switzerland: Author. Retrieved from www.who.int/tobacco/mpower/mpower_report_full_2008.pdf

WHO. (2008c). Conference of the Parties to the WHO Framework Convention on Tobacco Control, 3rd session (November 17–22, 2008). Retrieved from http://apps.who.int/gb/fctc/

WHO. (2009). WHO report on the global tobacco epidemic, 2009: Implementing smoke-free environments. Geneva, Switzerland: Author. Retrieved from www.who.int/tobacco/mpower/2009/en/index.html

WHO. (2011). WHO global infobase: Data for saving lives. Geneva, Switzerland: Author. Retrieved from http://apps.who.int/infobase/

WHO. (2012a). Chronic diseases and health promotion: STEPwise approach to Surveillance (STEPS). Retrieved from www.who.int/chp/steps/en/

WHO. (2012b). Tobacco free initiative: Partners and roles in the Bloomberg initiative. Retrieved from www.who.int/tobacco/communications/highlights/bloomberg_partners_roles/en/index.html

WHO. (2012c). Tobacco free initiative: Tobacco control directory. Retrieved from www.who.int/tobacco/global_directory/en/index.html

WHO. (2012d). Tobacco free initiative: United Nations ad hoc interagency task force on tobacco control. Retrieved from www.who.int/tobacco/global_interaction/un_taskforce/en/index.html

WHO. (2012e). Tobacco free initiative: WHO collaborating centres for tobacco control. Retrieved from www.who.int/tobacco/global_interaction/collab_centers/tobacco/en/index.html

WHO. (2012f). WHO report on the global tobacco epidemic: Warning about the dangers of tobacco. Geneva, Switzerland: World Health Organization. Retrieved from www.who.int/tobacco/global_report/2011/en/

WHO. (2012g). World Health Organization tobacco free initiative. WHO study group on tobacco product regulation (TobReg). Retrieved from www.who.int/tobacco/global_interaction/tobreg/en/

WHO. (2012h). World Health Organization tobacco free initiative. WHO tobacco laboratory network (TobLabNet). Retrieved from www.who.int/tobacco/global_interaction/toblabnet/history/en/index.html

WHO. (2012i). Tobacco free initiative (TFI). Protocols and guidelines. Global Adult Tobacco Survey. Retrieved from www.who.int/tobacco/surveillance/guide/en/index.html

WHO. (2012j). STEPS country reports. Retrieved from www.who.int/chp/steps/reports/en/index.html

WHO. (2012k). STEPS resources. Retrieved from www.who.int/chp/steps/resources/en/index.html

WHO. (2012l). The STEPS instrument and support materials. Retrieved from www.who.int/chp/steps/instrument/en/index.html

Yeatman, S., & Trinitapoli, J. (2011). Best-friend reports: A tool for measuring the prevalence of sensitive behaviors. *American Journal of Public Health*, *101*, 1666–1667.