

*Edited by Sevgi O. Aral, Kevin A. Fenton,  
and Judith A. Lipshutz*

# The New Public Health and STD/HIV Prevention

Personal, Public and  
Health Systems Approaches

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Editors

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Personal, Public and Health Systems  
Approaches

 Springer

*Editors*

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The findings and conclusions in this book are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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## Foreword

Public health, public health research, and STI/HIV prevention science are all at crossroads. “Expansion,” “Advancement,” “Repositioning,” and “Paradigm shift” have become frequent expressions associated with prevention science and public health. As it became increasingly clear that prevention of HIV infection and many other sexually transmitted infections (STIs) remained beyond reach, even in the presence of efficacious interventions, attention has shifted to the importance of dissemination and implementation of effective interventions. Differences between efficacy in clinical trials, effectiveness in the real world, and large impact at the population level have become increasingly evident. Contextual understanding of STD/HIV epidemiology now includes understanding of social and structural determinants; sexual and social networks; and geographic, demographic, and subpopulation concentrations. Effective preventive interventions must focus on issues of targeting, coverage, and scale-up. Current economic realities highlight the importance of cost-effective resource allocation and maximization of return-on-investment in public health. Public health leaders and practitioners are considering how STI/HIV prevention fits into a system that creates a positive and sustainable dynamic between public health and health care institutions and trains individual providers to appreciate and incorporate population health.

The editors have brought together a team of international experts to present the evolution of promising new approaches in *“The New Public Health and STD/HIV Prevention: Personal, Public and Health Systems Approaches.”* The concise and thoughtful “Introduction” provides an excellent summary of the new directions in the field. The section on social determinants and other influences on STI/HIV represent emerging paradigms in public health (e.g., sexual networks, concentration, and geographic and temporal dispersion of STI/HIV).

Critical factors in approaches to prevention are also addressed, including scaling up, targeting, and coverage, and distribution of prevention resources and its impact on sexual health. The book further highlights prevention approaches for population groups, as well as specific programs taking decidedly

systemic, multicomponent approaches. The critical reviews of specific prevention programs in different developed countries provide interesting historical accounts of focused prevention efforts.

This book will be of great interest and value to experts in STI/HIV prevention and beginning students in health sciences alike, whether their background is in medicine, public health, the social sciences, or systems science.

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## About the Editors



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Bank. She has received the ASTDA Achievement Award and the Thomas Parran Award. Over the years, her research interests have included social and behavioral aspects of sexually transmitted disease epidemiology and prevention; including gender, age and race effects; mixing patterns; sexual and social networks; contextual factors; social determinants and most recently, program science. Dr. Aral came to the Centers for Disease Control in 1978 from Middle East Technical University in Ankara, Turkey where she was the chair of the Department of Social Sciences.





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number of critical efforts to address the U.S. HIV epidemic, including the release of revised HIV screening recommendations to make HIV testing a routine part of medical care for all Americans, and the implementation of a new surveillance system to provide more precise estimates of new HIV infections in the United States. Under Dr. Fenton's leadership, CDC has also expanded its efforts to engage, mobilize, and partner with at-risk communities to address health disparities, and CDC launched *Act Against AIDS*, the first national HIV/AIDS public health communications campaign in 20 years. He has authored or co-authored more than 200 peer-reviewed scientific articles and policy reports.



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Sexually Transmitted Infections (STI), including HIV, remain among the most prevalent and costly health conditions facing western industrialized countries. In the United States alone, more than 19 million STIs are believed to occur each year, costing approximately \$17 billion in diagnosis, treatment, and care costs [1, 2]. In Europe there are more than two million people living with HIV, and in 2010, 27,116 newly diagnosed HIV infections were reported across the European Union and the European Economic Area (EU/EEA) [3]. As with the US, the STI epidemics are remarkably distinct in individual countries. While some conditions such as chlamydia and the viral STIs are highly prevalent and demonstrate patterns consistent with generalized epidemics, STIs overall continue to disproportionately affect certain key populations, in particular men who have sex with men (MSM), persons originating from

countries with generalized HIV epidemics and people who inject drugs. In many industrialized settings, governments continue to struggle with bringing these epidemics under control as they face stable or increasing STI/HIV rates among MSM, high prevalence of undiagnosed infection among young people, and poor coverage of treatment, care, and vaccination services for at-risk populations.

Recent advances in prevention, treatment, and care options for these conditions combined with improved political awareness and support provide opportunities for hope. Advances in biomedical prevention approaches for HIV, including the use of highly active antiretroviral treatment that both improves the clinical outcomes for people living with HIV and reduces onward transmission of HIV infection, have drawn attention to the importance of balancing individual and population approaches to health as part of STI/HIV prevention efforts. In contrast, many challenges now faced by programs directly reflect the difficulties in public health funding, design, and implementation of effective prevention and clinical interventions. Chief among these are the funding challenges imposed by the global economic downturn; reforming of health and public health systems towards greater accountability, quality, and impact; changing public expectations for individual, family, and community health; and changing perceptions of the role of government, private, and community sectors in the delivery of health and healthcare. While

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these changes promise a new approach to public health, they also threaten to fundamentally change the way health systems, and therefore STI/HIV prevention, treatment, and care efforts, are delivered in the twenty-first century.

The understanding that STI epidemics are determined by the dynamic interplay between the individual, the infectious agent, the environment, and prevention and care interventions is now well established. Indeed, much of the historical response to STI/HIV epidemics have traditionally been led by partnerships between the clinical and public health sectors. It is therefore critical that our efforts to enhance the impact and effectiveness of STI/HIV prevention occur within the context of understanding and leveraging developments in public health systems and policy. Traditionally, public health's unique contribution to STI control has included assurance of robust clinical, behavioral, and laboratory surveillance; social marketing, health communication, and public education; policy formulation, implementation, and evaluation; partner notification; multi-sectoral collaboration; quality assurance and improvement; and research. As we move into the second decade of the twenty-first century, understanding how these traditional roles of public health are evolving and what might lie ahead will be important strategies for those interested in STI/HIV prevention.

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## **The New Public Health in Historical Context**

The definition, scope, challenges, and opportunities in public health change and evolve continuously—hence the repeated use of the term “The New Public Health” in the literature. Half a century ago, in an article dated September 1959, the late Milton Terris stated: “The changing character of public health is evident to anyone who wishes to see. This change implies consequences, however, and these are too often overlooked” [4]. Terris argued that the importance of epidemiologic research in the noninfectious diseases was not understood; most research funds went to laboratory and clinical studies; training in

biostatistics and epidemiology was inadequately funded; and only two state health departments—California and New York—had developed strong programs of research into the epidemiology of cancer, heart disease, and other noninfectious diseases. The challenges facing public health in the United States at the end of the 1950s included the present and potential shortages of physicians, dentists, nurses, and other health personnel. State health departments were encouraged to provide leadership to help meet these educational and training needs. At the same time Terris noted, “The responsibilities of public health today are much greater than ever before” [4]. Between 1950 and 1959, the real expenditures of local health departments failed to keep pace with the increase in population [5]. “Thus, at a time when under budgeted and understaffed state and local health departments face new and greater demands for their services, federal support for public health services is being curtailed rather than expanded” [4]. This description could easily fit public health in 2012.

Three and a half decades later (1995), a discussion paper by the World Health Organization [6] used the specific term, “The New Public Health” in the global context, and suggested that it was not so much a concept as it was a philosophy which endeavored to broaden the older understanding of public health so that, for example, it included the health of the individual in addition to the health of populations, and sought to address contemporary health issues concerned with equitable access to health services, the environment, political governance, and social and economic development. The new public health philosophy sought to put health in the development framework to ensure that health is protected through enactment of public policy, and included interest in identifying implementable strategies to solve the issues of the time, [6] again, a call for change that could have been formulated in 2012.

Reminiscent of the often observed generalization, the more things change the more they stay the same. Robert Wood Johnson's 2010 issue brief entitled, “Preventing Chronic Disease: The New Public Health” [7] focused on the need for policy change at the community level to change

people's lifestyles. The authors point to the recent global economic recession and the chronic disease epidemic in the United States that necessitate difficult decisions regarding the allocation of limited public health dollars. Their analysis supports proven community prevention programs in that they help to modify lifestyles that improve health, and policy interventions that constitute a powerful tool toward the success of such prevention programs.

The definition and scope of public health evolve continuously as a consequence of changing challenges including: shifting demographics, epidemiology, and the political, social, and economic environment; and changing opportunities in the form of biological, social and management science, and tools and technologies. Such change has important implications for public health in general and the control and prevention of specific diseases and conditions in particular.

---

### **Preventing Sexually Transmitted Diseases and HIV: Changing Challenges and Opportunities**

In the area of sexually transmitted disease and human immunodeficiency virus prevention, major changes have taken place over the past few decades, which have modified the scope and structure of both the challenges and the opportunities facing the field, thereby redefining public health in this domain. In this context, the relevant parameters include: the shift in our understanding of health from the sole provision of diagnostic and treatment services to sick individuals, to the provision of prevention services to well populations with the goal of maximizing wellness; the current global economic crisis and the consequent decline in financial resources available for public health; the related increased emphasis on accountability, efficiency, effectiveness, impact evaluation, and maximization of returns on public health investments; an epidemiologic transition from infectious to chronic diseases; demographic changes in mortality, fertility, and migration with their resultant modifications of the age, sex, and geographic

structure of populations; and significant shifts in sexual norms and behaviors accelerated by the effects of such population drivers as urbanization and globalization. Concurrent with these changes in challenges have been remarkable developments in the tools, technologies, and the science base available to public health and healthcare workers in sexually transmitted disease and human immunodeficiency virus prevention.

At this time, we have efficacious biomedical interventions for the prevention of sexually transmitted infections [8], and during the past few years biomedical interventions including male circumcision, microbicides, pre-exposure chemoprophylaxis, and early anti-retroviral therapy have been shown to effectively prevent acquisition and transmission of HIV [9–14]. However, challenges remain and exert pressure on public health so as to change its definition and scope. One such challenge involves the need for defining combination intervention packages which take into consideration the highly complex interactions among interventions and the context they are introduced into; and the need to maximize the synergies among interventions implemented concurrently while minimizing potential antagonisms among them [15–18]. Other challenges include: the limited arsenal of effective interventions; the difficulty involved in implementing effective prevention interventions at sufficient scale and intensity relative to the need; the scattering of interventions across geographic areas and the resulting inability to realize synergies that multiple interventions in one location could lead to; the insufficient targeting of interventions to key affected populations, especially in concentrated and mixed epidemics; and the lack of linkages between prevention services, between prevention, care and treatment services, and across clinical and community-based settings [19, 20].

These challenges push the boundaries of HIV and STI science. The outcomes that need to be focused on are no longer, solely, individual-level health outcomes, even if those are considered in the aggregate. It is important to attend to rates of transmission and acquisition that take place in populations. The key issues are no longer, solely,

those of biomedical interventions to affect biomedical processes or behavioral interventions to change risk behaviors of individuals. STI/HIV scientists now have to consider how much of the biomedical and behavioral interventions need to be employed, in which combinations, at what scale, to which subpopulations, at which time, for what duration. Concurrently, it is essential to figure out which resources (and how much) and which intervention combination will be used for which subpopulation in order to maximize returns on STI/HIV prevention investments.

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## The Changing Topography of the Science Base

The STI/HIV scientific field has responded to these challenges by issuing new guidance for HIV prevention programs [19] and by introducing use of new scientific paradigms to the field, such as implementation science and program science, to guide the new public health [8, 15]. The financial crises in the early twenty-first century and the resulting efforts to control public spending and debt have exerted growing pressure on traditional funding channels for health globally. Thus, two key issues for the new public health are strategic allocation of limited resources to maximize return on public health investments and the generation of additional resources for prevention [18, 20]. The public health field has responded to the need of generating additional resources by developing new funding mechanisms [20]. Strategic allocation of resources to maximize return on public health investments is the key focus of program science [18]. Cost-effectiveness, cost-benefit, and comparative effectiveness analyses are increasingly used to monitor return on investments.

Increasingly, health care providers are challenged to understand the determinants of health and policies that can influence health [21]. Physicians and nurses are expected to function as advocates for preventive policies in their communities. A new public health approach calls for its workers to move beyond the causes and effects of individuals' health; rather, they need to consider population science, and be well versed in

population-level determinants, transmission dynamics, complex interactions, and health systems.

Mathematical modeling, traditionally employed to describe infection transmission dynamics and to predict future behavior of epidemics, is increasingly the methodology the field turns to in support of policy choices and population-level evaluations of intervention effects. Recent examples of this practice include the use of mathematical modeling in the identification and description of combination interventions [22] and in the proposal that universal voluntary HIV testing with immediate antiretroviral therapy may be a viable strategy for eliminating HIV [23–25].

The so-called “prevention cascade” has become a salient focus for many in the operations research area following the realization that, despite availability of efficacious interventions for the prevention of mother-to-child HIV transmission (PMTCT), many in the developing world have had inadequate access to these interventions and scientific understanding of the field performance of the interventions was lacking [26, 27]. This emphasis marked a major shift in STI/HIV prevention science, away from a focus solely on efficacy to one which includes real-world effectiveness and population-level impact [28].

The focus on effectiveness, population-level impact, and thus, issues of coverage and scale-up, has highlighted the importance of health systems in STI/HIV prevention. Health systems strengthening interventions now receive considerable attention at both the programmatic and scientific levels [29]. Moreover, health systems strengthening efforts are now considered to be a specific approach to responding to HIV/AIDS epidemics [30]. Examples include the U.S. public health efforts to integrate STI and HIV programs and to promote public health practices in primary care settings.

The requirement that prevention efforts achieve population-level impact has reactivated methodological debates around best ways of monitoring and evaluating health at the population level and attributing effect to interventions. While some in the field argue for the need for community randomized trials and approximations to RCTs through the use of counterfactuals



where RCTs cannot be implemented, others point to the drawbacks of RCTs [31, 32]. The results of these debates will have to take sufficient account of the complexities involved in populations, the interactions that rule cause–effect relationships in complex systems, the importance of the interactions between interventions and the context into which they are introduced, and the interactions among interventions themselves.

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## Emerging Foci in the New Public Health Science

Several functions, which have traditionally been served by prevention program experts based on past experience, are increasingly becoming the subject of scientific inquiry and analyses. These new foci include analyses of social and sexual networks [33]; analyses of concentrations of morbidity and risk behaviors [34–36]; analyses of targeting of prevention interventions [37]; and potential strategic approaches to expanding coverage, and consideration of the health systems context [38]. These developments suggest public health science is undergoing major change and may look quite different in the coming decade.

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## Volume Contents

In this book, the authors examine present and anticipated sexual health challenges, their determinants and the populations that are disproportionately affected in a complex world with great inequalities. The book is divided into four sections that together provide an integrated perspective of personal, population, and systems-level aspects of STI/HIV prevention in developed country settings. These chapters are intended to provide a holistic view of the STI/HIV landscape in combination with pragmatic approaches to prevention.

The first section introduces socio-demographic factors and subsequent challenges that influence sexual health in the early part of the twenty-first century as well as societal issues that create parameters affecting the epidemiology of STI and HIV. Topics outside of the traditional social

determinants of health, such as migration patterns and commercial enterprises, are examined to demonstrate more direct implications of these influences. Adimora and Schoenbach describe the social determinants of heterosexual partnering and sexual networks as they relate to STI/HIV with emphasis on the US where STI rates exceed those of other industrialized countries. They argue for a new approach to STI/HIV prevention that addresses social determinants of STIs and other outcomes. Peter White’s chapter focuses on disparities in the distribution of STI and HIV in space, time, and by population group, and then explores the causes of these disparities and their implications for interventions. He argues that thinking in terms of populations, not just individuals, is critical to applying the best intervention science. Discussion includes the complex interaction of many factors often elucidated by theoretically based insight from mathematical modeling which allows the testing of hypotheses and guidance of empirical research. From an epidemiological perspective, Butler and Hallett examine the literature on migration and the spread of STIs, particularly HIV. They dissect the operations of migration as both a mechanism that brings infected individuals together with uninfected individuals and a trigger for different types of changes in behavior. While acknowledging data limitations, they suggest the importance of understanding the impact of migration on STI and HIV epidemics so as to identify appropriate interventions. Jolly and Wylie explore characteristics of sexual networks through theories of homophily, heterogeneity and social aggregation, and then describe networks wherein specific STIs and HIV survive. They review social network-inspired prevention strategies and suggest that a social network approach could facilitate analyses of social cohesion and social capital which in turn could positively influence network norms and lower STI rates. The authors conclude that network methods should be considered for routine surveillance and research but note the challenge of not knowing the extent to which their application results in an improvement over previous methods. In their chapter, Wohlfeiler and Kerndt frame their discussion of sexual health in the context of the need to balance achievement of



public health with protection of individual rights. They discuss these issues through two examples: patrons of commercial sex venues like bathhouses and sex clubs, and performers in the adult film industry. They argue that public health must work with these nontraditional partners to achieve positive health outcomes in populations vulnerable to STI/HIV infection.

Important considerations for successful implementation of STI/HIV programs constitute the focus of the second section of the book. These chapters address issues critical to ensuring high population-level impact. Chesson and colleagues discuss distribution of funding levels for HIV and STIs in the US and how it relates to burden of disease. In review of key models, they further discuss the association between funding levels and disease incidence and what might happen in either the absence or increase of funding. They conclude with discussion of resource allocation models, the importance of taking cost effectiveness into consideration when making funding decisions, and the potential of public investment in maximizing STD and HIV prevention impact. Peters and colleagues review the current state of knowledge and practice on scaling up and achieving universal coverage of HIV and STD health services as well as what is known about targeting interventions to specific populations. They contend that the concept of scaling up needs to go deeper than the simple notion of quantitative coverage of health services to ensure sustainable effects. Targeting approaches are assessed as ways to improve the effectiveness, equity, and efficiency of health service delivery. In recognizing the worldwide influence of electronic media, Rietmeijer and MacFarlane explore its role in STI/HIV prevention. They provide an overview of the scientific literature that has examined the Internet as an environment for STI/HIV risk, prevention and care, and propose avenues for future research and development of innovation at the interface between electronic media and the prevention and care of STI/HIV. They further suggest the role of new technologies in shaping a new approach to public health. Kevin Fenton's chapter describes the complexities of leadership and governance for prevention and public health

programs describing them as essential building blocks of effective health systems, robust public health responses, and ultimately, effective STI/HIV prevention and sexual health programs in western industrialized settings. He discusses the challenges facing the public health workforce and then critically examines the evolving definitions of leadership within the context of public health, STI/HIV prevention, and sexual health programs. He argues that successful public health systems, including those that support sexual health, require an understanding of the whole health system as well as both political action and technical solutions. The chapter identifies key domains for strengthening leadership for STI/HIV prevention and supports the need to continuously nurture public health leadership as a core component of successful sexual health programs.

The third section focuses on six specific populations disproportionately affected by STI/HIV with special attention to influences of social determinants on their sexual health. Jeanne Marrazzo writes about STD/HIV prevention issues for women, including opportunities such as the HPV vaccine and topical antiretrovirals for HIV. She acknowledges the diversity of impacted women and notes the complexities that underlie women's vulnerability to these infections. The chapter by Needle and colleagues focuses on persons who inject drugs (PWIDs) who constitute an estimated 15.9 million people worldwide and bear a disproportionate burden of STI/HIV. They document consequences and costs of not acting on science-based policies as well as the importance of scaling up comprehensive HIV prevention programs. They move on to examine macro-level, structural determinants of STI/HIV in PWIDs that shape vulnerability, risk, transmission and response to these infections. They conclude with a discussion of challenges that remain in addressing disease in this vulnerable population. Guadamuz and colleagues focus on men who have sex with men (MSM) acknowledging the many variables that operate beyond the level of the individual and influence their disproportionate burden of disease. They discuss a series of complex interrelated domains that impact the efficacy and effectiveness of STI/HIV prevention

practice among MSM in the US and suggest that there are opportunities to enhance health promotion programs that integrate multiple levels of intervention and make our research agendas more innovative. In particular, they suggest a new framework for STI/HIV prevention in MSM based on the syndemics theory which acknowledges the interaction of various psychosocial health conditions as enhancers of the harmful effects of each other and together raise risk levels for STI and HIV. Dean and Myles explore how the sexual health of various racial/ethnic groups is influenced by structural and social determinants and provide examples of the impact of key societal systems on the ability of racial and ethnic minorities to achieve optimal sexual health. They discuss systems-based approaches to improve sexual health and reduce rates of STIs among racial and ethnic minorities in the United States.

Focused on adolescents, Fortenberry and Hensel explore an approach to STI prevention that shifts the traditional approaches of risk factor reduction to a construct that emphasizes sexual health. They suggest an approach that supports healthy sexual development while still maintaining attention to adverse outcomes of sexual behaviors such as STIs. Their construct is linked to three key public health indicators: number of recent sex partners; frequency of condom use; and STI. Sexual health, they suggest, is a guiding paradigm for a successful public health approach to STI prevention.

The final section includes a series of critical reviews of recent prevention programs that have addressed STI/HIV prevention from a systems-level perspective. These programs incorporate dimensions beyond the traditional approaches including many represented in this book. Two HIV/AIDS programs are illustrated in the first couple of chapters for the US and Australia. With an historical lens, Valdiserri provides a critical review of programmatic responses to the HIV/AIDS epidemic in the US which help elucidate efforts that have resulted in successful prevention outcomes, deconstruct and analyze attempts that have failed, and continue to refine our knowledge of the various determinants that influence program success and failure. This chapter explores a

variety of prevention approaches spanning those that target individuals, focus on communities, or strive to alter the systems that serve individuals, families, and communities at risk for acquiring or transmitting HIV. He demonstrates the complex interplay between people, communities, systems, and circumstances that have and must continue to be considered to address the HIV epidemic. Mindel and Kippax describe Australia's approach to HIV/AIDS through a partnership model that includes government, affected communities, public health, and research institutions. They credit their ongoing success to use of a social public health framework which, when effective, recognizes that people are not only individuals but also members of groups, networks, and collectives. Their analysis includes comparisons with approaches of other developed countries, including the US. The next review by Valentine and DeLisle illustrates lessons learned from the 1999 syphilis elimination campaign in the U.S. which aimed not only to eliminate the disease but also to reduce disparities in sexual health and improve public health capacity. The campaign sought to better address a variety of individual factors and social determinants that sustain the infectious syphilis epidemic by promoting public health interventions at the individual, community, and structural levels. As the campaign did not reach its intended goals, the authors concluded that epidemics can evolve faster than agencies, programs, or research can address them, as was the case with the syphilis elimination campaign in the US. They note challenges at local, state, and federal levels in willingness to adjust strategies when outcomes fall short of expectations. Markowitz and Hariri review the status and impact of the recently recommended HPV vaccine in the U.S. with a focus on its role in prevention of associated outcomes such as cervical cancer. Noting that the addition of this vaccine adds primary prevention strategies to cervical cancer prevention, the authors discuss the opportunities it avails for interaction among traditional and nontraditional disciplines as part of the arsenal of cervical cancer prevention as well as the potential to reduce disparities in cervical cancer morbidity and mortality. They also discuss such challenges as

public perceptions, vaccine uptake, high cost and low access issues. The comparison of approaches to Chlamydia control in the US and UK is the topic of the chapter by Low and colleagues. After reviewing the evolution and current state of Chlamydia control efforts in both countries, they raise questions about the real impact of these models in reducing burden of disease, including adverse outcomes, and in turn suggest the need for additional innovations outside the current paradigm to control this pervasive disease.

Given the timely but evolving nature of many of these topics and the challenging context of public health in the twenty-first century, the literature continues to grow as will the public health responses to these pervasive infectious diseases. Moving ahead, our challenge will be to apply what is known, for the populations in greatest need, at a scale and coverage for appropriate impact, with a commitment to learn, improve, and evaluate as we implement. No doubt, new iterations of a “new public health” will continue to be topics of discussion for upcoming generations of public health researchers, policy makers, and practitioners.

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**Part I**

**Socio-demographic Societal and  
Supra-Societal Determinants  
and Influences**

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# Social Determinants of Sexual Networks, Partnership Formation, and Sexually Transmitted Infections

# 2

Adaora A. Adimora and Victor J. Schoenbach

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## Social Determinants of Sexually Transmitted Infection

Social factors have long been recognized as important determinants of health [1]. In recent years, social determinants—“the conditions in which people are born, grow, live, work and age, including the health system” (WHO Commission on Social Determinants) [2]—have attracted increasing attention as fundamental causes of disparities in health status between individuals and populations. Although most studies about social determinants address chronic, non-communicable diseases, a recent examination of the social epidemiology literature from 1975 to 2005 found 44 review articles with infectious disease outcomes, with the majority focused on HIV/AIDS [3]. The emphasis on HIV is perhaps not surprising, since HIV and other sexually transmitted infections (STI) are by their nature social diseases. Researchers have recently begun to trace the pathways between social determinants and HIV/STI [4–7]. The expression of sexuality, a perva-

sive influence in human society, is shaped by society. Social factors of all kinds, including those related to education, occupation, neighborhoods, migration, urbanization, mobility, affluence, media, religion, substance use, incarceration, and technological change, can influence sexual behaviors, partnership formation, and sexual networks, with resultant effects on STI dissemination. This chapter explores some of the primary modern-day social determinants of heterosexual partnering and sexual networks relevant to HIV/STI, particularly in the USA, where STI rates exceed those of all other industrialized countries [8].

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## Determinants of STI Transmission

Key determinants of the extent of spread of an STI from an infected person to others are the likelihood of transmission during sexual contact, sexual contact rate and sexual network patterns, and duration of infectiousness of an infected person. The likelihood of transmission depends partly on the prevalence of infection in the pool of potential sexual partners [9]. Effective health care, including prompt and appropriate diagnosis and curative treatment, shortens the length of time during which infected people remain infectious. Even treatment that is not curative may reduce infectiousness. Most notably, antiretroviral therapy (ART) for HIV-infected patients decreases their levels of HIV viremia and likely decreases their infectiousness to others, an observation that

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