Concurrently Advancing Sexual Rights and Next-Generation Sexually Transmitted Infection Prevention Through Innovative Analytical Methods

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In the past decade, international public health discourse has increasingly endorsed the idea that achieving and maintaining sexual and reproductive health (SRH) is a fundamental human right.[1–3] In the context of sexually transmitted infection (STI) prevention, this rights-centered paradigm affirms the importance of people's ability to receive evidence-based, SRH-focused services that are appropriately tailored within their individual circumstances.[4] Both STI risk and access to adequate care are now well documented to be embedded within the fabric of different social (e.g., gender or sexual identity, race/ethnicity, stigma, and neighborhood characteristics), economic (poverty, residential instability, migration), and psychological (e.g., mental health and shame) factors.[5–7] A rights-based framework recognizes that because these factors can multiplicatively create unique STI exposures, next-generation public health initiatives must be designed to effectively identify and respond to these differentiated needs.[8,9]

One important way that we expand the evidence base for new public health knowledge and support a rights-based perspective is engaging innovative statistical techniques that are designed to identify the overlap in factors that impede SRH.[10,11] In this issue of the *Sexually Transmitted Diseases*, van Wees et al.[12] give us an example of these principles, using latent transition analysis (LTA) to examine the longitudinal grouping patterns of STI-associated risk factors among a sample of young adult heterosexual STI clinic attendees in the Netherlands. Latent transition analysis is an extension of a larger family of

analytical techniques (for an excellent review, see Collins and Lanza[13]) that are focused on understanding how subgroups—or "profiles"—of individuals are similar (or different) on a set of risk factors in ways that differentiate their level of exposure to a given condition.[14] Latent transition analysis extends this application to understand how these risk profiles change or remain stable over a given period.[15] The idea of examining of longitudinal patterns in STI-associated risk behaviors over time is not a new research concept. Many traditional *variable-centered* statistical approaches either examine the influence of each risk factor individually over time (e.g., regression)[16] or assume that groups of risk factors (e.g., factor analysis) expose all people to the same average STI risk level over time.[13] Latent transition analysis is a *person-centered* approach that first categorizes people into different classes or types of STI risk (e.g., risk profiles) at each time point based on their response patterns to multiple variables (e.g., the psychological and behavioral factors) and then examines if and/or how people shift in risk profile membership over time.[17] In this way, a researcher is able to regard STI risk in a more ecologically valid way, allowing for the possibility that individual risk factors in a given population of people may cohere differently—and impact STI risk differently—over time.[18] Such ecological validity is important to a sexual and reproductive rights framework because it provides greater fidelity to the ways in which STI is lived and experienced by individuals themselves.

A full technical review of LTA is beyond the scope of this editorial (see Collins and Lanza[13] for a review), it is useful to point out how the use of LTA according to van Wees et al. supports a rights-based perspective. Latent transition analysis provides STI *risk profile characteristics*—including the "best-fitting" number of baseline STI profiles, the patterns of risk factors defining each profile, and the stability of the quantity and nature of profiles at each follow up point. These pieces of information provide clues about the extent of heterogeneity (a greater number of profiles or groups) or homogeneity (a fewer number of profiles or groups) in the sample, as well as the caliber of risk an individual exemplifies based on the characteristics of group they occupy. In the current article, these layers of information are particularly useful to increase the precision of targeted interventions by understanding how STI

vulnerabilities differ among a group of STI clinic attendees that are already classified as "risky." For example, van Wees et al. identify 4 profiles (Supplemental Digital Content 2 Table S3), 2 of which are both *behaviorally* "high risk" but are quite different in terms of the type of *psychological* factors defining them. The "insecure high-risk" and "confident high-risk" groups are similarly low condom use and similarly medium/high on the number of sexual partners in the past 6 months, but have the opposite values on self-esteem, stigma, and shame. The authors also link these class memberships to baseline demographic differences ("confident" class members were more likely to be male and highly educated) and STI exposure differences (confident class members were more likely to have been notified by their partner for STI exposure). These nuanced differences are an important demonstration that there is not a "one size fits all" STI intervention solution, and that infection reduction efforts are likely to fail unless they incorporate a person-level understanding of what drives risk decision making in a person's life.

Another important contribution that van Wees et al. provide is an analysis of the *longitudinal patterns* in risk profiles. The factors underlying STI risk normatively change in early adulthood (e.g., partnership structure, motivations for sex, and chosen sexual behaviors),[19] also making it possible for individual risk level itself to change over time. Understanding the *nature* of any STI risk profile change and *impact* of this change on STI outcomes has important implications for how ongoing surveillance is conducted in key populations. In the current article, after establishing that the baseline 4 class profile remained consistent at all follow-up points, van Wees et al. observed that less than one-fifth of the sample changed risk profiles throughout the year—meaning that, for most people, the type of risk they present remains stable. When change occurred, the most common movement was between high-risk class and low-risk or condom-using classes, or between low-risk or condom-using classes. Although the nature of data collection did not permit analysis of why change occurred, identifying who changes, when they change, and how they change can provide the information necessary to broaden the ways in which a rights-based intervention can be applied to risk reduction. For example, although sexual partner monogamy is emphasized as a primary means of STI reduction, avoiding multiple partnerships may not be a feasible intervention target

for an individual in 1 of the 2 "high-risk" classes in this study if their local sexual norms promote concurrency,[20] when the perception of low partner availability leads to nonmonogamous relationships,[21] or when they perceive a partner is not monongamous.[22] Transitioning such an individual from a "high-risk" to a "low-risk" class over time may be more efficacious by targeting the psychological characteristics that intercede on their ability to enact health behaviors, independent of their actual intentions to do so.[23] As the authors point out, additional work will certainly need to clarify the optimal timing of intervention delivery, the most effective combination of intervention targets, how to implement interventions in clinical practice. These challenges notwithstanding, this kind of integrative intervention approach—in which common individual vulnerabilities are identified and remediated at the same time—is virtually unaddressed in the STI literature and could represent one example of what the next generation of an *evidence-based, rights-centered* STI control and prevention framework looks like.[24] Active stewardship to ensure no population is left behind means that we pay ongoing attention—as STI clinicians, as STI educators, and as STI researchers—to ensure that we design innovative solutions that dually promote both prevention and equity.[25]

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