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Bundling of STDs and HIV in Prevention Messages

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Abstract

Purpose —This study aims to explore peoples cognitive perceptions of HIV and other sexually transmitted diseases (STDs) to inform decisions on message development with regard to message bundling, with limited research on the concept of bundling-related prevention messages and no studies that consider the bundling of HIV and other STD prevention messages.

Design/methodology/approach —Individual and small-group interviews were conducted with 158 African American men and women to explore perceptions of STDs and communication preferences. Open-ended questions and a pile-sort exercise were used to elicit individuals' judgments on similarities of 12 STDs, including HIV. Interview data were coded and analyzed for themes and patterns; pile sort data were analyzed using multidimensional scaling (MDS) and cluster analysis to visualize the set of relations identified from the piles.

Findings —STDs and HIV are associated with stigma, risk behaviors and personal responsibility. The card sorting activity revealed two primary dimensions by which people organized STDs: seriousness and curability. Potential clusters of STDs that correspond to participants described sorting strategies were identified and they may have implications for message bundling. Disaggregation of the data by sex and age revealed slight variations in the relationships of HIV and human papillomavirus (HPV) to other STDs.

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Originality/value —By identifying a set of cognitive attributes people use in organizing the overall semantic domain of STDs, ideas can be generated for how best to combine STD and HIV messages to meet public health communication goals.

Keywords

Health promotion; Social marketing theory; Message framing; HIV; STDs; Bundling

Introduction

Since the emergence of the HIV/AIDS epidemic in the 1980s, the US Congress has maintained separate funding streams for prevention and treatment services for HIV and for other sexually transmitted diseases (STDs). Consequently, many organizations, including leading US government agencies [e.g. the Centers for Disease Control and Prevention (CDC) and the Health Resources and Services Administration (HRSA)], have maintained separate administrative units and distinct surveillance, prevention, screening and treatment initiatives for HIV and for other STDs, despite the fact that HIV is most commonly acquired through sexual transmission (Jourden and Etkind, 2004). The root of this administrative separation lies in the early days of the HIV epidemic when limited knowledge of the disease, lack of treatment, and social and political attention all served to uniquely shape the public health response.

However, as widespread HIV testing and effective treatment have become available, many core prevention and clinical activities for HIV are aligning with those of other STDs (e.g. screening, partner notification and treatment) (Ward and Fenton, 2007). Efforts are currently underway to better integrate the clinical and public health response to HIV and other STDs (Ward and Fenton, 2007). Integrating services, for instance, may provide individuals with more comprehensive care related to sexual health and potentially result in clinical and preventive benefits as well as programmatic efficiencies. One example is the provision of comprehensive HIV, viral hepatitis and other STD screening, diagnosis, treatment and social services in clinical or community health settings. By the same token, CDC recommends the integration of messages and the development of social marketing campaigns to address the needs of individuals or subpopulations with overlapping risks for multiple STDs (including HIV and hepatitis) in a more holistic and cost-effective way. Such messages could encourage appropriate testing, treatment and prevention services for all STDs. This approach stands in contrast to the way that public health agencies have traditionally approached STD prevention campaigns by focusing on a single communicable disease, such as gonorrhea, HIV or syphilis.

However, it remains unclear whether and how to integrate or bundle messages for the promotion of STD awareness, prevention, testing or treatment. From a messaging perspective, it is important to consider the implications of communicating about HIV and other STDs as separate medical conditions (e.g. epidemiology, populations at highest risk and levels of effectiveness of interventions), as well as possible differences in perceptions engendered in the minds of the public because of the historical separation of these conditions and greater attention to HIV in the media. Related to this latter concern,

consumer research with African Americans suggests that HIV ranks among their top health concerns (Kaiser Family Foundation, 2009), whereas more commonly occurring STDs do not (Friedman and Sheppard, 2007). To date, no published studies have demonstrated whether communicating about HIV and other STDs separately or in combination is a more effective approach for promoting awareness, prevention or testing.

Bundling of related health messages

In commercial marketing, product bundling refers to the strategy of selling two or more different products together for one price (Levin et al., 1996). The social marketing analog is to combine multiple preventive behaviors for either a single disease or multiple conditions in a single message to members of a target audience.

The idea of message bundling seems to make intuitive sense; however, empirical studies have reported mixed results regarding its efficacy (Fortmann et al., 1993; Fridinger and Kirby, 2002; Hovick et al., 2008). In the 1980s, bundled messages promoting heart health (e.g. watch your diet, exercise and stop smoking) were disseminated, but the results suggest that the bundled messages were less effective than other unbundled messages (Fortmann et al., 1993). Fridinger and Kirby (2002) investigated the bundling of physical activity and healthy eating messages, and concluded that it remains questionable whether including both nutrition and physical activity in messaging will have an impact on consumers' behavior. Finally, Hovick et al. (2008) conducted focus groups with low-income women to explore bundling preconception health messages. The results showed that both single and bundled messages increased aided and unaided awareness of the messages over levels found in a control group. Also, there was no significant difference in the percentage of messages correctly identified on an aided or unaided basis among one, three and four messages. Overall, these results suggest that message bundling can be used without compromising recall.

Message bundling of HIV and other STDs, however, differs from the aforementioned forms of bundling in that many of the same behavioral messages are likely to be applicable to both HIV and other STDs. For example, behavioral objectives for condom use to prevent HIV, gonorrhea or chlamydia are fundamentally the same. Consequently, there is the potential to bundle combinations of individual STDs in conjunction with a single preventive behavior. As such, the quantity of behavioral objectives, as emphasized in many previous studies on bundling, may not be a concern. However, people's perceptions or conceptions of HIV and other STDs, and how they are related, may be important to people's receptivity of messages. At the same time, subtle but important differences exist regarding the transmission, prevention and curability of different STDs, which may influence condom effectiveness, screening availability and recommendations and treatment options for different STDs. These factors need to be taken into consideration when developing messages.

Applying the brand concept to understand people's perceptions of STDs and HIV

The concept of brands comes from commercial marketing and is used to understand the overall or bundled set perceptions consumers have about a particular product (or line of products) that go beyond its tangible features (Keller, 2003). Brands are considered to be

multidimensional in terms of the judgments that people make about them, and, as such, exist as cognitive structures in the minds of consumers. These include various types of knowledge about the brand, including its category or type, individual features or characteristics, perceived benefits or deficits, previous experiences with the brand, attitudes and feelings about the brand and potential goals related to it (Keller, 2003; Labroo and Lee, 2006).

One potential way to conceptualize the interplay of different perceptions of STDs, including HIV, is in terms of competing brands. The utility of the brand concept is that it provides a framework for understanding the symbolic value of items from a consumer's perspective. Furthermore, brands attributes are considered to be mutable, such that people's awareness of them (i.e. ability to recall and recognize the brand) and fluctuations in a brand's equity in the marketplace (i.e. value added to a product just by brand association) can be changed. Moreover, brands can be leveraged, e.g. linking a brand to some other person, place, thing or brand), extended (i.e. used with related products) and diluted (i.e. over-extension of brand to too many products) (Keller, 2003; Levin et al., 1996).

From a research perspective, brands be can evaluated individually in terms of a number of scaled attributes, such as brand loyalty or trust, and then compared to other brands. Alternatively, if the goal is to understand a brand's unique position within a market, investigations may look into the particular semantic associations people make with a brand (Keller, 2003) and attempt to identify the attributes that are most salient in distinguishing it from another brand. A hallmark of the latter approach involves visualizing aggregate similarity or difference data using techniques, such as multidimensional scaling (MDS) (Woelfel and Danes, 1980; Cooper, 1983), correspondence analysis (Hoffman and Franke, 1986) and cluster analysis (Punj and Stewart, 1983). In using these techniques, each brand comes to occupy a unique cognitive space among all other items of its type (e.g. all cars, all STDs), with a brand's location in that space, largely defined by its place on one or more continuums, representing key or salient attributes used in defining the brand. The results of MDS and similar techniques are qualitative and offer insights into the perceived similarity of items and identifying the features or attributes that people most often use in making judgments about them (Weller and Romney, 1988).

Study goals

Our study had two primary goals:

1. to explore how participants cognitively organized HIV and other STDs; and
2. to explore the use of the brand concept as a conceptual framework for thinking about and making decisions concerning whether or how various STDs and HIV can be bundled in future health communication campaigns and interventions designed to address the disproportionately high rates of STDs, including HIV, among African Americans (CDC, 2011a, 2011b).

Methods

We conducted qualitative in-depth interviews with 64 individuals and 32 small-group discussions (2-4 participants per group) in four US communities in summer 2010. The

research venues comprised two urban locations (one in the Midwest and one in the South) and two rural locations (both in the South), all with high cumulative incidence of STDs among African Americans. Eligible participants were English-speaking African American men and women aged 18-45 years who reported being heterosexual and having had sex in the past six months. Prospective participants were recruited by telephone through professional recruitment firms and through street outreach, chain referrals, advertisements in local publications and electronic bulletin boards and community flyers. Interested participants were screened and scheduled for interviews by phone, with the goal of recruiting a majority of single participants and equal numbers by age (18-29 and 30-45 years), sex (male and female), education (high school diploma or less and more than a high school diploma) and income segments. Small-group discussions were segmented by age (18-29 and 30-45 years) and sex. Interviewers, matched to race and sex of participants, conducted the discussions in market research facilities for the two urban sites, and at community-based organizations for the two rural sites. A semistructured discussion guide was developed to explore (among other items) participants' free associations with the term "STD" and conceptualizations of STDs and HIV.

At the beginning of each interview or small group discussion, and prior to any substantive discussion of STDs and HIV, participants were asked first to share any words they associated with the term "STD". In the small group discussion sessions, this was done as a group activity. Following the free association exercise, participants individually completed a systematic card sorting exercise. The card sorting exercise was used to explore participants' judgments of the similarities between HIV and other STDs to identify cognitive attributes used in organizing the overall semantic domain of STDs. We presented each participant with 12 preprinted cards, listing commonly occurring STDs, including HIV, and asked participants to independently sort the cards into piles of similar STDs. The STDs used in the card sorting exercise were drawn from information on common STDs provided on the CDC Web site. Each card used in the sorting exercise included the medical name for the STD, as well as alternative or slang names identified through an Internet search. To explore potential differences in audience perceptions of the human papillomavirus (HPV) and one of its more common associated conditions, HPV and genital warts were presented on separate cards. We instructed participants to make more than one pile, but no more than seven piles. After the participants sorted the cards, we asked them to describe each of their piles and any criteria for inclusion in the particular pile.

For the card sorting data, we entered each participant's response, sex, age, income, education and location (urban or rural) into Visual Anthropac-Pile Sort version 1.0.2.60 (Analytic Technologies, Lexington, KY), a program designed for the analysis and visualization of proximity data. Using this software, MDS was conducted, whereby sorted items perceived to be similar to one another were plotted on diagrams near each other and items perceived to be different from one another were plotted far away from each other. The MDS results yield data about the perceived similarity of items and assist the researcher in identifying the features or attributes that people most often use in making judgments about them (Weller and Romney, 1988). Visual Anthropac also provides a measure of stress (or fit) to the data related to the MDS plots. Stress below the 0.15 level is generally considered to be an acceptable visual representation (Weller and Romney, 1988). Cluster analysis involves

assigning observations into subsets based on similarity or difference. Analysis with Visual Anthropac involves a routine for Johnson's hierarchical clustering (Borgatti, 1996) to overlay cluster analysis results onto the MDS diagrams. Outputs from the MDS and cluster analyses were then used to identify patterns and relationships in the data. The research protocol was approved by both the CDC and RTI International Institutional Review Boards.

Results

All 158 participants in our study completed the card sort exercise. However, we excluded four participants who did not sort all of the cards from the analysis, resulting in an overall valid sample of 154. The participant characteristics are largely a function of the recruitment targets we set *a priori*. The set of participants were split almost evenly by sex (female = 50.0 per cent, male = 50.0 per cent). Ages ranged from 18 to 45 years, which were evenly split between the "younger: 18-29" years (50.9 per cent) and "older: 30-45" years (49.1 per cent) age groups. Participant education was also evenly distributed between two levels: high school graduate or less (50.0 per cent) and some college or more (50.0 per cent). The predominant relationship status among participants was currently single (79.8 per cent); the remaining participants were married (18.3 per cent) or divorced/widowed (1.9 per cent). Almost half of the participants reported full-time employment (47.1 per cent) and household incomes less than \$20,000 (47.1 per cent). Most had health insurance (65.0 per cent) and had been tested for STDs at least once (85.4 per cent); 60 per cent reported having been tested within the past year.

Free associations with the term "STD"

In the interview, we asked participants what came to mind when hearing the term "STD". Initial reactions overwhelmingly alluded to risk behaviors and the need for personal responsibility to prevent STDs (e.g. knowing your partner and practicing safer sex), with frequent statements about STDs being the result of having unprotected sex and multiple sex partners. Men commonly mentioned terms such as "careless", "dirty" and "unclean". Many men also stated that "loose women" get STDs.

A majority of both men and women stated that contracting an STD would make them feel "dirty" or "bad". More women than men provided emotive responses, such as feeling a sense of fear, embarrassment and loneliness if they were to contract an STD. A few women also stated that they felt there was more of a stigma against black women who had an STD than black men who had an STD.

Participants also tended to list specific STDs that came to mind, such as HIV, herpes, chlamydia, gonorrhea, syphilis, crabs and HPV. When probed about HIV, participants generally acknowledged that it is an STD, but differentiated it by its severity and alternate acquisition routes (i.e. HIV can also be transmitted through needles and breast milk).

MDS with cluster analysis overlays

We began our analysis of the card sort data by conducting an MDS based on each participant's pattern of sorting the cards, as shown in Figure 1. This diagram identifies each individual who completed a card sort, using a code based on urban/rural location (i.e. points

identified with an A or a C denote participants from urban locations and points identified with a G or an R from rural locations). The overall clustering or bulls-eye pattern in the diagram indicates a high level of agreement among the majority of participants in how they sorted the STDs. However, a stress of 0.260 suggests distortion in the visual representation of the data, suggesting that the relationship between the different data points is difficult to express and interpret only in two dimensions.

Next, we analyzed participants' aggregate judgments about the similarity of the various STDs, as shown in Figure 2. To interpret this MDS diagram, we considered both the cluster of individual items and the overall dimensions by which the items were sorted. Lines on the diagram illustrate the suggested dimensionality. Following the horizontal line from right to left, is a dimension based on the *seriousness* of the different STDs. The diagonal line moving from the lower left corner to the upper right corner captures the dimension of *curability*. Hepatitis B and HIV, both serious and incurable STDs, appear toward the right-hand side of the diagram. Observed in the lower left corner are STDs considered to be curable and generally perceived by individuals as being less serious (e.g. bacterial vaginosis, chlamydia, trichomoniasis and gonorrhea). Alternatively, this latter dimension may suggest differences in perceptions between viral and bacterial STDs, with viral STDs appearing in the upper-right corner and bacterial STDs appearing in the lower-left corner. The plot shows acceptable stress (i.e. below the 0.15 level).

Subsequently, to gain an understanding of how the sorted STDs clustered, a cluster analysis was overlaid on the MDS diagram described above, as shown in Figure 3. Dividing the STDs into three clusters based on their perceived similarities reveals potential categorical groupings. In the upper-right corner, hepatitis B, HPV and HIV are grouped together: STDs previously identified as serious and incurable. Pubic lice, genital warts and genital herpes appear in the middle of the figure. Finally, in the lower-left corner, a cluster of what may be considered common bacterial STDs appears (i.e. bacterial vaginosis, trichomoniasis, chlamydia, gonorrhea and syphilis). It should be noted that HIV is the last STD to be joined to a cluster. This suggests that it represents the one STD perceived to be most different from the others. If a fourth partition is added to the cluster analysis, HIV becomes its own independent cluster (plot not shown).

Figure 4 is the same MDS diagram as Figure 1, except that in the former, participants are identified by their sex (M = male, F = female) as opposed to their geographic location. This plot shows a strong clustering among both males and females in the middle of the diagram; however, a number of males are shown along the right-hand side of the diagram. This suggests some difference in how men and women sorted the STDs. To further elucidate potential differences in the way in which men and women sorted the STDs, we ran separate MDS models for males and females.

The MDS diagram for male participants demonstrates good stress (i.e. 0.136), as shown in Figure 5. Among male participants, HIV becomes its own individual cluster after just one partition. In this plot, bacterial vaginosis and trichomoniasis appear together as a distinct group.

The MDS diagram for female participants includes all women who participated in the sorting exercise with a five-partition cluster analysis overlay, and demonstrates good stress (i.e. 0.113), as shown in Figure 6. Upon visual inspection, HIV and hepatitis B are closer to each other than HPV is to any other STD after five partitions. Moreover, when HPV is added to a cluster, it is seen as closer to genital warts and herpes than to HIV or hepatitis B.

We also examined sorting strategies by age and produced separate MDS diagrams for each age segment: younger (18-29 years) versus older (30-45 years). Both plots have acceptable stress. Among younger participants, HIV becomes its own separate cluster after three partitions, as shown in Figure 7. In contrast, among older participants, HIV is still associated with hepatitis B after five partitions, as shown in Figure 8.

Sorting strategy was further analyzed by both sex and age (not shown), and the patterns previously described independently for both of these participant characteristics persisted. For example, younger men viewed HIV as separate from all other STDs after just two partitions, and older women continued to view HIV as more similar to hepatitis B than HPV.

We generated individual MDS diagrams for participants in each of the four research sites, and the findings were consistent with those from the overall sample. In addition, we generated MDS diagrams by education, marital status and income, which did not result in any notable pattern differences.

Participants' narrative descriptions of card sorting strategies

We analyzed the participants' narrative descriptions of the piles they sorted, which corresponded with the dimensionalities (e.g. serious and incurable) identified in the MDS analysis. Additional strategies also emerged. Participants sorted their cards based on their own knowledge (or perceived knowledge) of the various STDs. During the sorting process, many participants verbally shared what they knew about individual STDs. Based on these remarks, some participants' clearly possessed erroneous knowledge or beliefs related to STDs. The various strategies that participants reported using when sorting their piles are provided in Table I.

The strategy that participants most commonly reported using to sort their piles was whether they considered an STD to be curable or treatable versus incurable (Table I), followed by whether an STD was considered potentially deadly. The latter strategy or criterion was, for the most part, defined by the presence of HIV in the pile. The third most commonly reported sorting strategy was unknown STDs, or "Never heard of/don't know of STD". Sorting cards into this pile does not represent a judgment as much as a potential lack of knowledge about a particular STD (e.g. bacterial vaginosis, trichomoniasis, chancroid and HPV). This category appeared to be used more frequently by participants in rural sites.

The next most commonly reported sorting strategy was participant judgments as to whether an STD is serious or not, which mirrors much of the right-to-left ordering observed on the MDS graphs. Participants used Criterion 5 to classify STDs that can be transmitted in ways other than sexual contact. Female participants used this criterion more often than male participants. However, as a sorting criterion, this strategy is not clearly identifiable on the

MDS graph. In addition, several men ($n = 16$) and women ($n = 7$) used the feature of being able to see (e.g. sores) or feel (e.g. bumps) an STD as a strategy for sorting the listed STDs. Other sorting strategies included familiarity with or perceived commonness, skin-to-skin transmission, blood-related transmission and mode of treatment. It is important to note that the various strategies were not mutually exclusive, as individuals often reported using multiple strategies to sort the cards.

Discussion

The findings from the free-association exercise suggest that STDs are generally stigmatized and often associated with an individual's personal risk behaviors. HIV was often named among the list of infections that are associated with the term "STD". Although participants acknowledged that HIV is an STD, they also distinguished it from other STDs by its severity and alternate routes of transmission.

Based on the card sort analysis for the overall sample and participants' verbal explanations of card sorting strategies, the dimensions of *seriousness* and *curability* appear to be highly salient in the participants' organization of STDs. Within the two continuums of seriousness and curability, participants tended to sort HIV closer to hepatitis B and HPV (other untreatable viruses and precursors to potentially fatal diseases), suggesting some core similarities in participants' perceptions of these STDs. This relationship is reinforced by the fact that HIV remains associated with these STDs until the fourth partition in the cluster analysis of all participants.

After three partitions of the full sample's MDS results, three key groups of STDs emerge. One group could be called "personally stigmatizing" STDs (i.e. herpes, pubic lice and genital warts). Key features of this group of STDs include visible symptoms, social and sexual stigmatization, difficult treatment or incurability (except in the case of pubic lice) and that they are not as serious as some other STDs. A second group of STDs could be labeled "common" STDs (i.e. bacterial vaginosis, trichomoniasis, chlamydia, gonorrhea and syphilis), which have historically been the mainstay of medical and public health STD interventions. In contrast, a third group consists of HIV, HPV and hepatitis B, the "new STDs" that are generally characterized by the attributes of being incurable or leading to serious disease.

In the "new STDs" group, gender differences in people's understanding of STDs are a factor, as HPV seemed to vary between men and women in its centrality to this group. Women tended to view HPV as more similar to genital warts and herpes than to HIV or hepatitis B. A potential explanation for this difference may be women's greater awareness or knowledge of HPV as a result of HPV vaccine marketing efforts that have targeted women. In contrast, men's lack of knowledge about HPV may have contributed to them viewing it closer to HIV and hepatitis B. For example, when describing their sorting strategy, a few men linked HPV with HIV based on the similarity of their acronyms.

Disaggregation of the data by sex and age also revealed slight variations in the relationships of HIV to other STDs. Men and younger participants viewed HIV as more distinctive from

the other STDs, sorting it into its own pile more often than women. This may explain why HIV is the first STD to form an independent cluster among all STDs. Participants' descriptions of their piles and discussions during the free-association exercise suggest that they may view HIV differently because it can be transmitted by means other than sex. It should be noted that whereas HIV (i.e. AIDS) is certainly among the most potentially fatal of STDs, other STDs may also be transmitted through nonsexual routes (e.g. vertical transmission and needle sharing/blood).

Implications for future communications

Despite a push to integrate STD and HIV prevention and treatment efforts, there have been few attempts to evaluate whether and how to combine STDs and HIV to create effective messages that meet our public health goals. With no reported studies on the differential impact of varying groupings of STDs in messages, we are left to use both inductive thinking and intuition as to how best bundle STDs in communications. This research, however, attempts to improve this process by interjecting research methods and theory found in consumer brand analysis to better understand consumers' relational perceptions of various STDs and HIV to make more informed bundling decisions.

So what then does branding theory suggest in terms of identifying potentially viable approaches to the bundling of STDs in messages? An obvious answer is to freely combine those STDs that align with participants' existing judgments of the similarities of those STDs. In this regard, we would expect that STDs on one or the other ends of the continuums of curable vs. incurable or serious vs. not serious, as well as those that tended to cluster into descriptive groups, such as "common" or "personally stigmatizing" are more likely to be seen as sharing common features and when bundled together in messaging would result in less cognitive dissonance, which may ultimately confer some benefits in regards to receptivity.

Playing on existing perceptions, however, is likely to reify the public's perceptions. If one's goal is to strategically change or align public perception to meet educational or marketing objectives, then consideration should be given to how one can "leverage" or "extend" existing perceptions of STDs to benefit communications. Figure 9 shows the key evaluative dimensions as identified the general MDS results (Figure 1) and serves as a useful heuristic for thinking about potential ways of realigning peoples' perceptions of STDs through enhancing specific associations.

Starting from this grid, we can look at the potential of combining HIV with other STDs that are viewed as serious, such as syphilis, chlamydia and gonorrhea (lower-left quadrant), but are also more likely to be seen as treatable. This combination of STDs could benefit efforts to promote HIV screening or testing, where it is helpful for individuals to view HIV as both serious enough to warrant action, and there being clear benefit to taking action. Conversely, one could associate HIV with the other incurable STDs, such as hepatitis B and HPV, found in the upper, left quadrant. These STDs are incurable, like HIV, but are also seen as less serious. In this case, the bundling of these STDs might benefit communication where the underlying message concerns the long-term implications for health, without the fatalism sometimes associated with HIV. Note that genital warts and genital herpes were left out of

consideration in the latter discussion of bundling options. This is because we can also consider guidance from the results of the cluster analysis (Figure 3), which suggest a potential categorical difference between those STDs and the others found within that same quadrant.

On the other hand, when STDs do not share key attributes, branding theory also suggests the potential for negative effects in associating such STDs from the possible dilution of their core attributes. For example, some STDs, such HIV, may be feared more than others (e.g. chlamydia). While it is possible that associating less serious STDs with HIV could dilute this aspect of HIV in messages, it is also possible that this association could decrease HIV-related fears and prevent protective behaviors, such as seeking testing and treatment.

In addition, in certain cases, it may be wise to avoid bundling. For example, separating HPV from other STDs, as many did in their sorting of the diseases, (and associating it with cancer) may make strategic sense in promoting vaccination or cervical cancer screening, particularly given the ubiquity of HPV and dire to not associate with potentially stigmatized STDs.

Ultimately, the efficacy of any combination of HIV and other STDs in health communication messages will depend on campaign goals and will require additional message testing. Nevertheless, the application of the brand concept to understanding people's perceptions of disease, in this case STDs, and the use of associated methods to explore those perceptions offer a starting point for theorizing and systematically approaching the question of how best to bundle HIV and other STDs in prevention messages.

One limitation, in particular, of this study is that it was conducted among African Americans living in four high-STD incidence locations in the USA. Consequently, these findings may not be generalizable to African Americans or to other populations in the USA.

To date, the evidence of the effectiveness of message bundling is limited. Specifically, bundling HIV and STD messages differs from the types of behavioral messages explored in other studies. However, the findings from the free association, card sorting exercise coupled with the prevention strategies reported by participants could be applied to inform the development of bundled messages that could be pretested with African American audiences for comprehension and acceptability. These messages could then be refined and tested for efficacy in an experimental study design.

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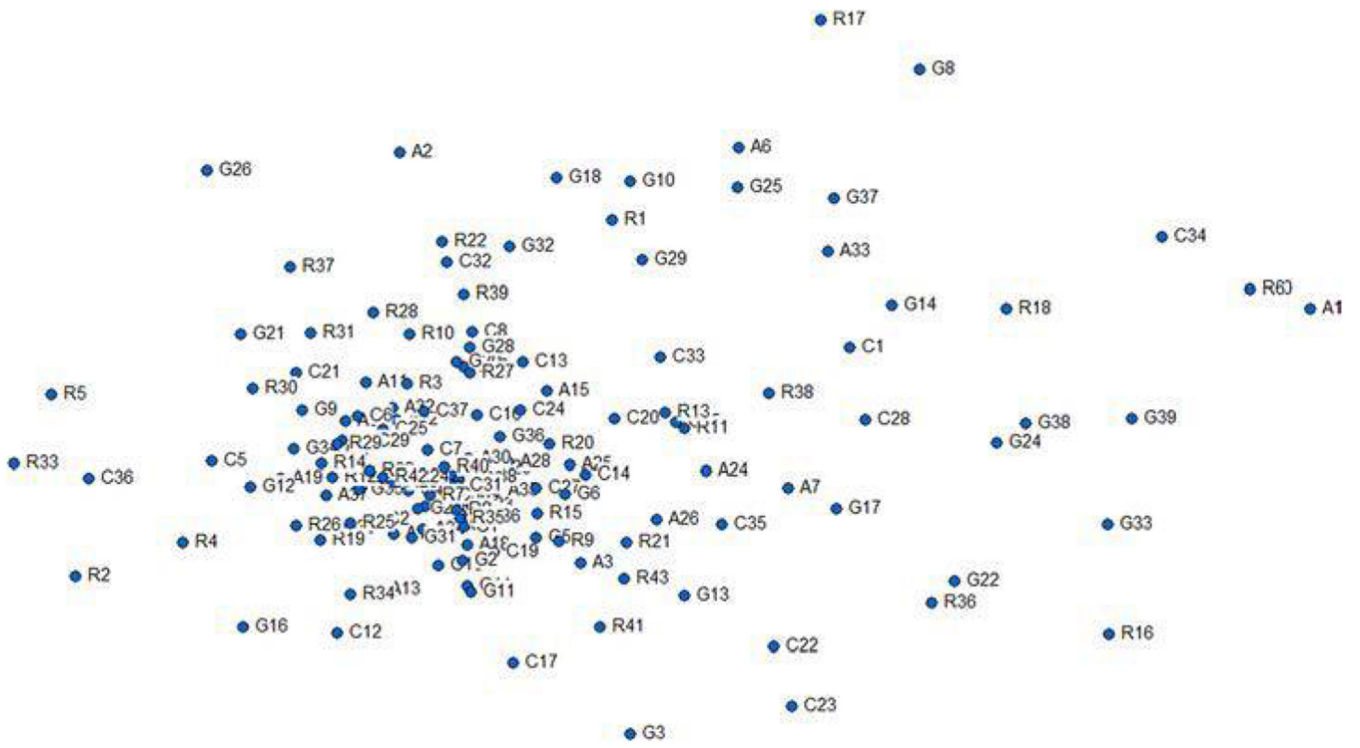


Figure 1.
MDS plot of the similarity of all participants by geographic location

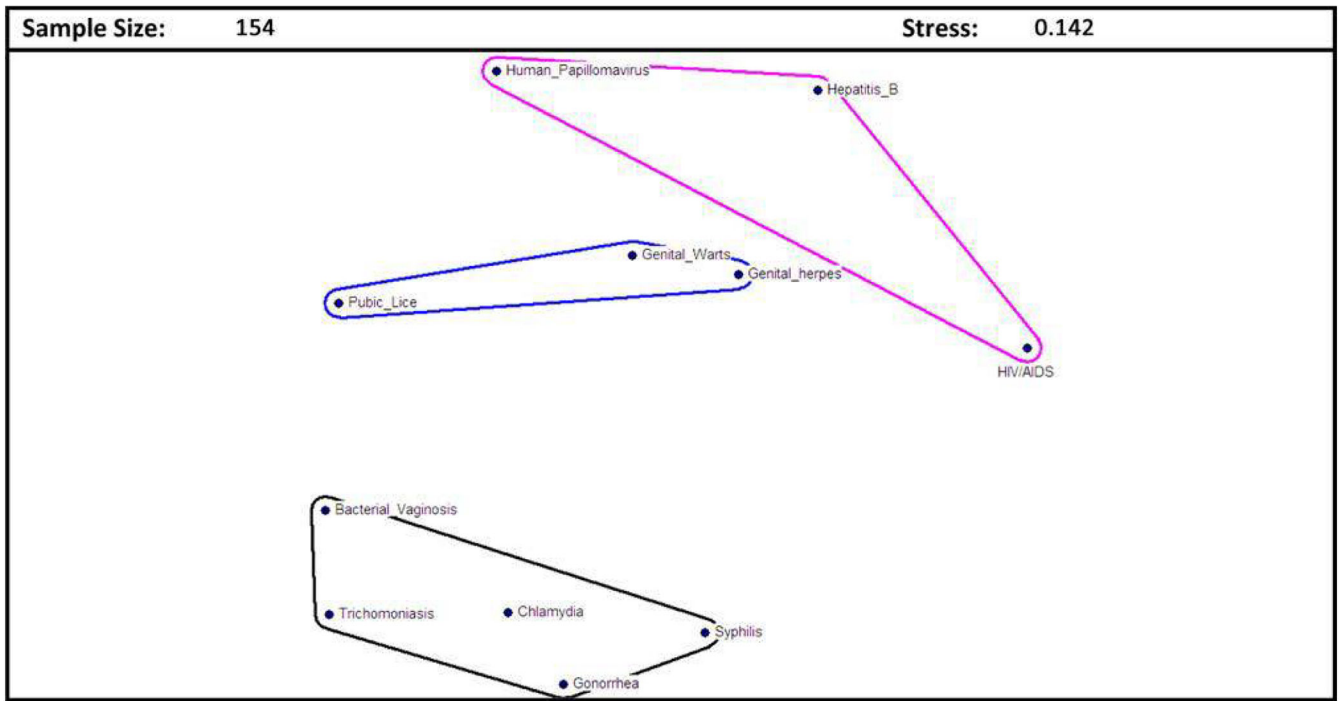


Figure 3.
MDS plot of the similarity of sorted STDs with cluster analysis overlay

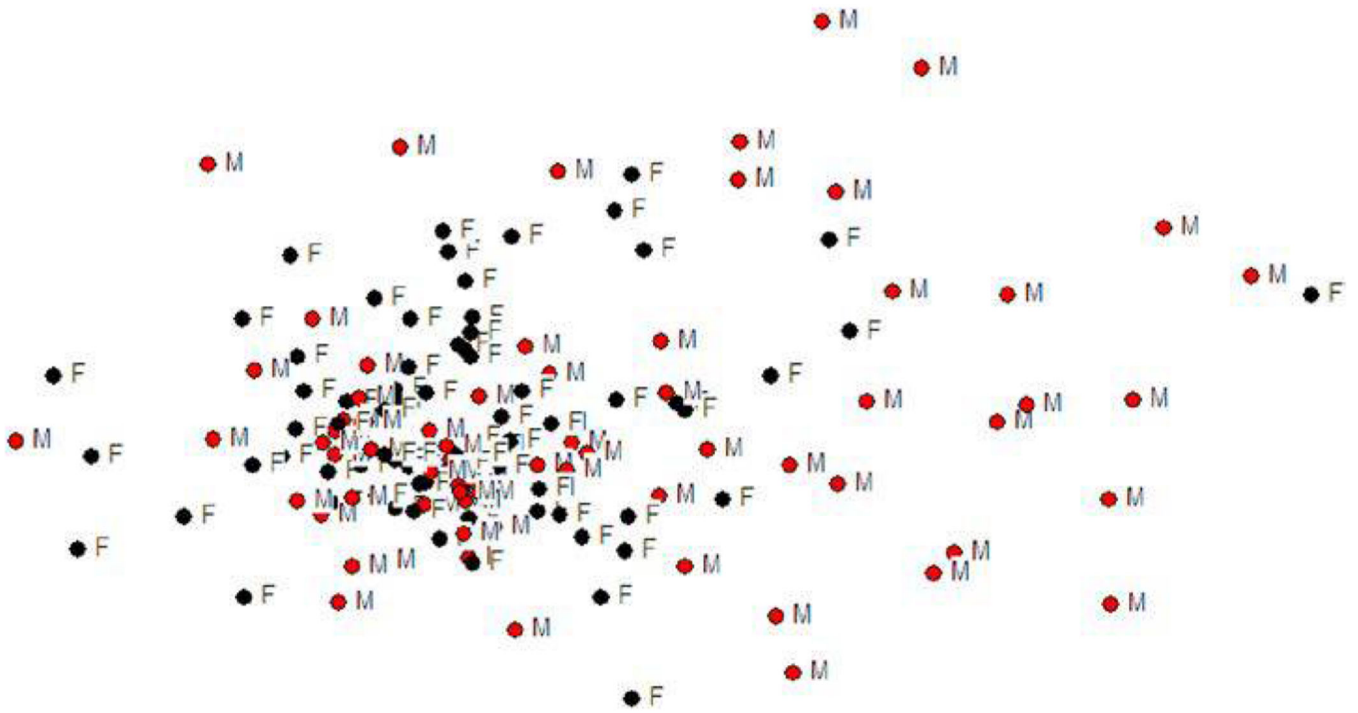


Figure 4.
MDS plot of the similarity of all participants by sex

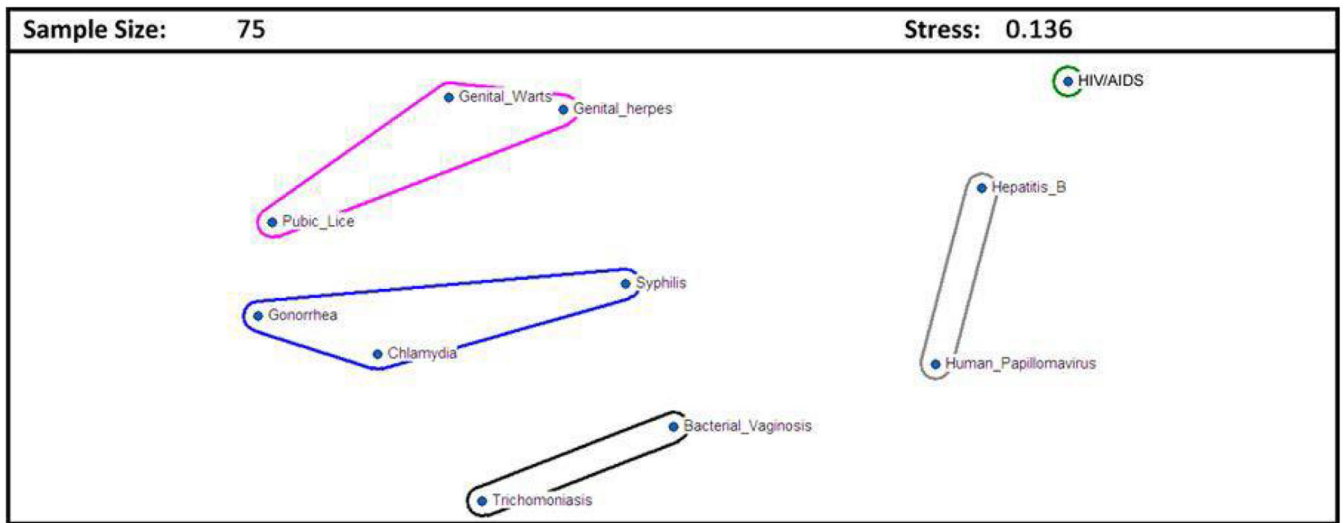


Figure 5.
MDS plot of all male participants with cluster analysis overlay

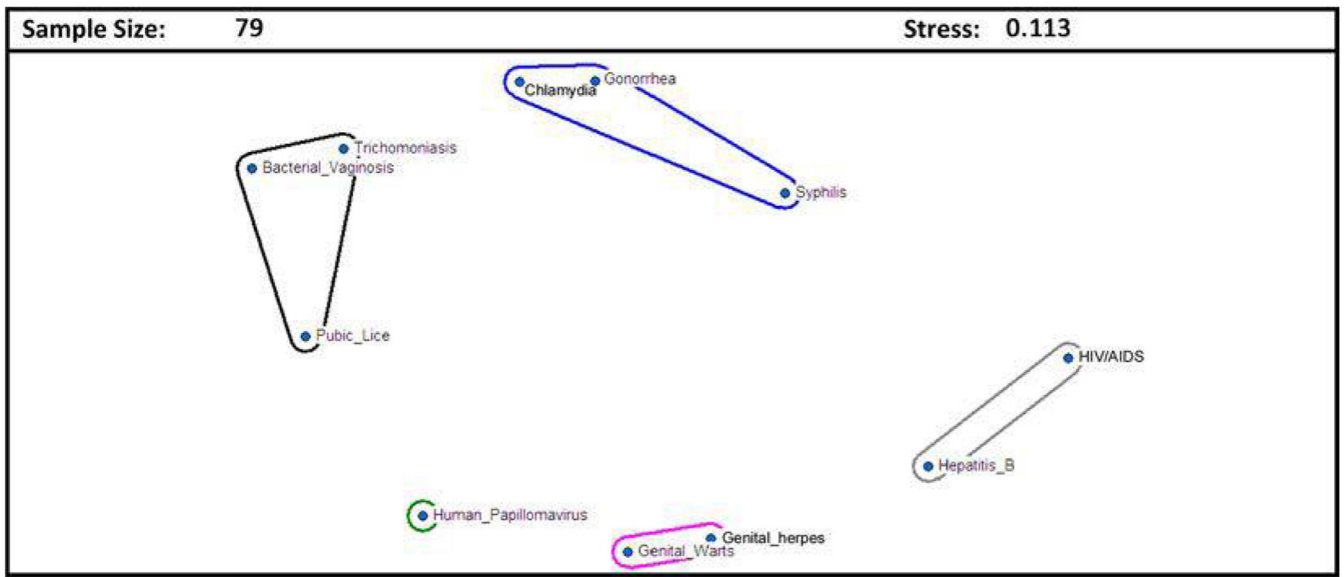


Figure 6.
MDS plot of all female participants with cluster analysis overlay

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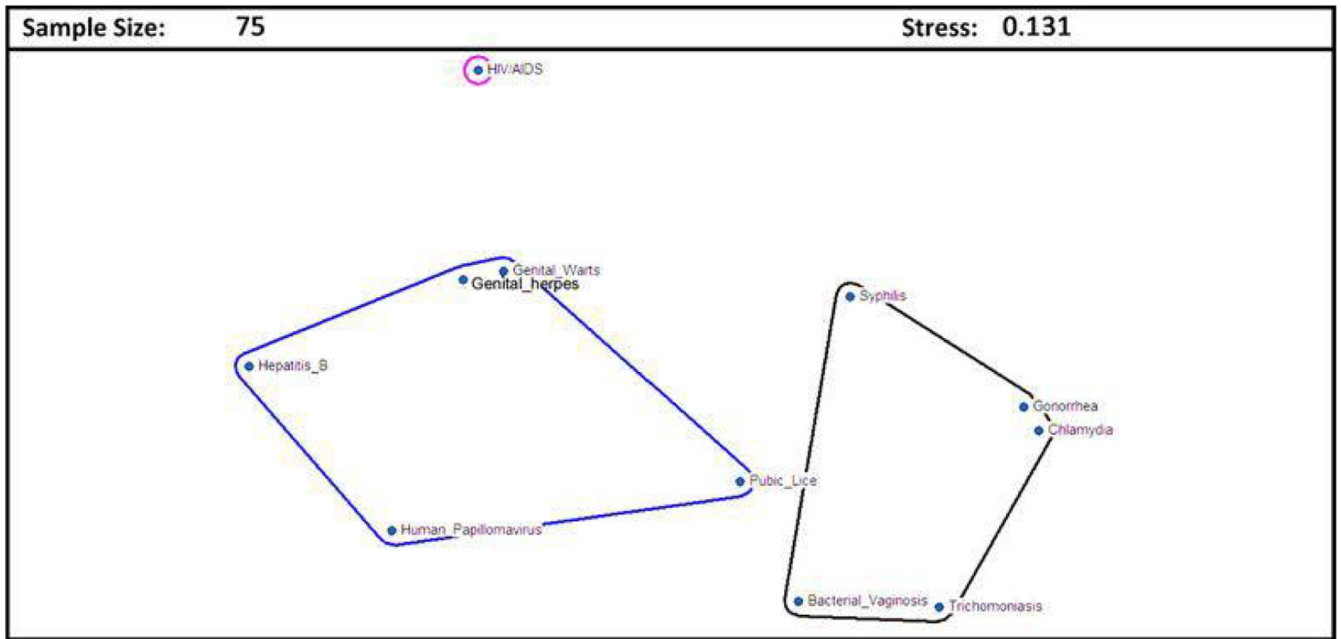


Figure 7. MDS plot of all younger participants (aged 18-29 years) with cluster analysis overlay

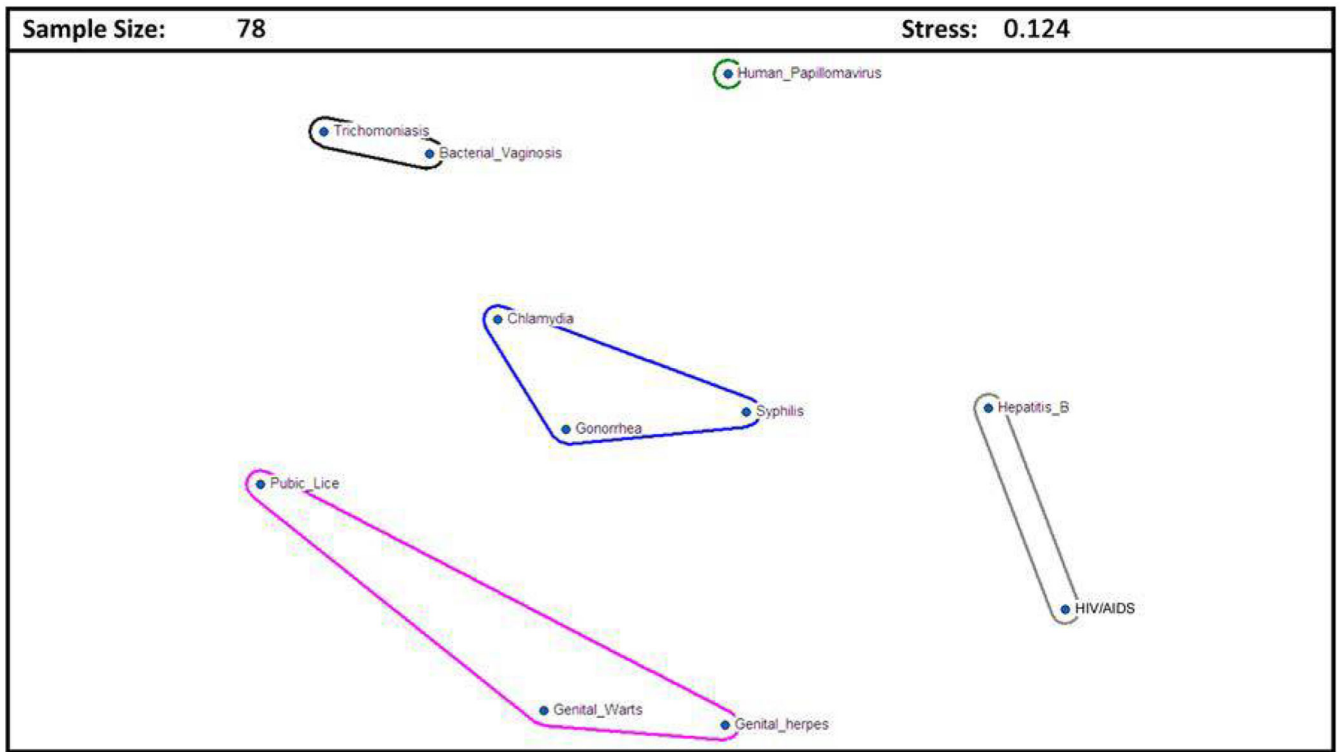


Figure 8.
MDS plot of all older participants (aged 30-45 years) with cluster analysis overlay

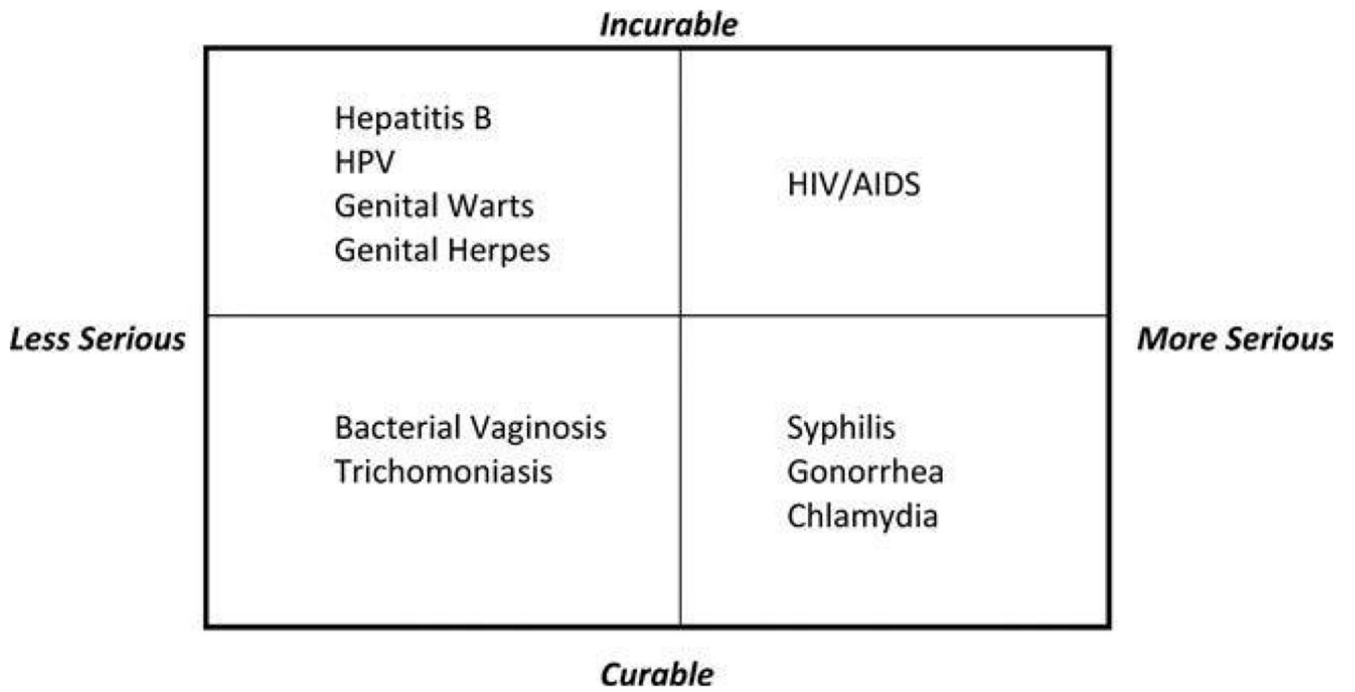


Figure 9.
Key evaluative dimensions for STDs and HIV

Table I.

Reported strategies used in card sorting exercise

| Criteria used in sorting STDs | STDs commonly mentioned | Number of times sorting strategy identified by participants | | |
|---|---|---|--------------------|--------------------|
| | | Females ^a | Males ^a | Total ^a |
| STD is curable/treatable vs incurable | Curable/treatable: Bacterial vaginosis, chlamydia, gonorrhea, pubic lice, syphilis and trichomoniasis Incurable: Genital herpes, gonorrhea, hepatitis b, HIV/AIDS, HPV and genital warts | 40 | 43 | 83 |
| STD is deadly | Gonorrhea, hepatitis B, HIV/AIDS and syphilis | 21 | 22 | 43 |
| Never heard of/don't know of STD | Bacterial vaginosis, chancroid, HPV and trichomoniasis | 19 | 21 | 40 |
| STD is serious vs not serious | Serious: Gonorrhea, hepatitis B, HIV/AIDS and syphilis Not serious: Bacterial vaginosis, chlamydia, genital herpes, pubic lice and genital warts | 17 | 14 | 31 |
| Can get STD in ways other than sex | Bacterial vaginosis, hepatitis B, HIV/AIDS, HPV, pubic lice and genital warts | 17 | 10 | 27 |
| STD can be seen/visible bumps or sores | Genital herpes, human pubic lice, syphilis and genital warts | 7 | 16 | 23 |
| STD is common/familiar/old | Bacterial vaginosis, chlamydia, genital herpes, gonorrhea, syphilis and trichomoniasis | 9 | 11 | 20 |
| STD is caused by pubic/genital area contact | Chlamydia, genital herpes, gonorrhea, pubic lice, syphilis and genital warts | 6 | 12 | 18 |
| STD is blood related | Hepatitis B, HIV/AIDS, syphilis and genital warts | 8 | 6 | 14 |
| Mode of STD treatment (e.g. ointment, cream, pill and shot) | Chlamydia, genital herpes, gonorrhea, pubic lice, syphilis, trichomoniasis and genital warts | 6 | 7 | 13 |

Note:

^a Shaded cells denote the top five strategies used by each group