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Amanda Kalyn MacGurn Date

Health Risk Behaviors in Peace Corps Volunteers

By

Amanda Kalyn MacGurn
MPH

Hubert Department of Global Health

_____

Kate Winskell, PhD
Committee Chair

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By

Amanda MacGurn

BA Foreign Language and Culture
Southern Oregon University
2006

Thesis Committee Chair: Kate Winskell, PhD

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in the Hubert Department of Global Health
2013

Abstract

Health Risk Behaviors in Peace Corps Volunteers
By Amanda MacGurn

Background
With the expansion of the United States Peace Corps and other opportunities for Americans to reside overseas, there is a growing need to gain a clearer understanding of factors that affect the health of Americans living abroad. The circumstances surrounding Peace Corps service present a unique set of challenges to the health of Peace Corps Volunteers (PCVs), the various effects of which are largely undocumented at present.

Methods
Data on a range of behaviors practiced during and immediately prior to Peace Corps service were collected from 358 recently Returned Peace Corps Volunteers (RPCVs), using an original, web-based survey distributed through established RPCV networks. McNemar's tests and Chi-square tests were used to assess associations on dichotomous variables, while paired t-tests were used to compare changes in behaviors before and during Peace Corps.

Findings
Respondents' self-reports indicated statistically significant increases in tobacco use ($p<0.001$) and hitchhiking ($p<0.001$) during Peace Corps. Chi-square tests showed significant changes in pre-Peace Corps to during Peace Corps measures, and t-tests indicated the direction of change: during Peace Corps service, significant changes were reported in tobacco use frequency ($p=0.0002$), alcohol use frequency ($p<0.001$), average number of alcohol units consumed per occasion ($p<0.001$), marijuana use ($p=0.052$), and seatbelt use ($p<0.001$). When stratified by sex, male respondents reported having a higher number of sexual partners ($p<0.001$) and engaged more often in sexual intercourse during Peace Corps than females ($p=0.0012$). When asked whether overall risk behaviors increased, decreased or stayed the same during Peace Corps, 61.6% of respondents indicated an increase in their own risk-taking behaviors.

Conclusions
RPCVs reported having engaged more often in risk-taking behaviors during Peace Corps, compared with the period immediately before departure, with some variation by region, sex and age. This exploratory study has implications for targeted prevention and health promotion efforts for future Peace Corps Volunteers.

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Acknowledgements

I would like to formally recognize and thank Dr. Kate Winskell for her ongoing encouragement and insight as my faculty and thesis advisor. Her support and thoughtful feedback were instrumental in the development of this thesis. I would also like to thank Dr. Solveig Cunningham for her guidance during the development of the survey used for this study, and for ongoing feedback at several different stages of the study's development. Finally, I would like to thank all those who participated in this study, as well as the National Peace Corps Association, RPCV member groups, and individuals who helped to disseminate the *Peace Corps Health Risk Survey* to RPCVs around the U.S.

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Chapter 1: Introduction

1. Introduction and Rationale

In the globalized landscape of the 21st Century, the need to gain a clearer understanding of factors that affect the health of Americans living abroad has assumed new significance. With the number of volunteers participating in the United States Peace Corps steadily increasing [1], as well as rising numbers of students engaging in study abroad programs [2], health promotion among those living abroad is of growing relevance to the overall health of Americans. The health risks and behaviors that affect Peace Corps Volunteers are the focus of this study.

The U.S. Peace Corps, an agency of the United States government established by John F. Kennedy in 1961, sends volunteers to live and work in low- to middle-income countries for a 27-month period [3]. According to the 2012 Peace Corps catalog for prospective volunteers, participants begin receiving technical, language and cultural training prior to arriving in their country of service, and undergo an intensive training during the first 2-3 months after arrival before beginning their 24-month commitment to different Peace Corps-designated communities. Volunteers are brought back together periodically for further training opportunities throughout their 24 months of service, but otherwise spend their time assisting in work specified by each host country [3].

Peace Corps Volunteers (PCVs) serve worldwide, working with local counterparts and/or local governmental or nongovernmental organizations while also learning regional languages and actively working to integrate themselves into the host communities they serve. Peace Corps provides training and guidance regarding safety and security, health maintenance and disease prevention, culturally appropriate behavior, and advice on how

to exercise sound judgment while abiding by Peace Corps policies and procedures; however, volunteers often serve in rural areas where there are inherent risks to health and safety [3].

According to the official Peace Corps website, over 210,000 volunteers have served in 139 countries worldwide. In July, 2012, 8,073 PCVs and trainees were serving in 76 countries and performing volunteer work across the sectors of education, health, community economic development, environment, youth in development, and agriculture. In 2011, 77% of PCVs were serving in rural towns with populations under 25,000, or in villages [4]. The median age at the start of service is 28, with only 7% over the age of 50. Of PCVs, 93% are unmarried and 62% are female [5]. The stated mission of the Peace Corps is to "…promote world peace and friendship by:

- Helping the people of interested countries in meeting their need for trained men and women
- Helping promote a better understanding of Americans on the part of the peoples served
- Helping promote a better understanding of other peoples on the part of Americans"[3]

In order to accomplish these goals, PCVs live in diverse, new environments, where they strive to integrate into host cultures while providing service to communities that are often underserved. The circumstances around Peace Corps service present a unique set of challenges to the health of PCVs, the various effects of which are largely undocumented at present.

2. Problem Statement

Studies on risk behaviors among young American travelers have focused on alcohol use [2], sexual behaviors and drug use [6] among college study-abroad participants.

However, few studies have been conducted on risk-taking behaviors specific to Peace Corps Volunteers.

3. Purpose Statement

The purpose of this research is to assess the prevalence of risk behaviors related to smoking, illegal drug use, alcohol use, sexual activity, transportation and drinking water among Peace Corps Volunteers. Additionally, these behaviors will be compared to retrospective self-reports of the same behaviors prior to Peace Corps service in order to assess whether individuals engaged in more risk behaviors – or engaged more frequently in risk behaviors – during Peace Corps.

4. Research Questions

The following questions will be addressed by this thesis:

Question 1: Is there a change in the risk behaviors of Peace Corps Volunteers during as compared with before Peace Corps service?

Question 2: Which risk behaviors – if any – change, and how?

Question 3: Which risk behaviors are the most prevalent among PCVs, and how do those vary across region, age and sex?

5. Significance Statement

This research study will inform our current knowledge of behavior-related health risks to Peace Corps Volunteers serving in diverse settings worldwide. This investigation has

implications for future efforts to prevent health risks and promote healthier lifestyles of Americans living abroad.

6. Definition of Terms:

Africa- one of the three major world regions in which Peace Corps Volunteers serve

EMA- Europe, Mediterranean and Asia- one of the three major world regions in which Peace Corps Volunteers serve

HCN- Host Country National

IAP- Inter-America and Pacific- one of the three major regions in which Peace Corps Volunteers serve

PCV- Peace Corps Volunteer

RPCV- Returned Peace Corps Volunteer

Unit of alcohol- As defined in the *Peace Corps Health Risk Survey*, a unit of alcohol includes 12 ounces of beer, one small glass of wine, one shot of hard alcohol, or one mixed drink

Chapter 2: Review of the Literature

A limited number of studies have been conducted on the health of Peace Corps Volunteers, and fewer addressing their health risk behaviors. As a result, a review of the existing, publicly available literature on Peace Corps Volunteer health and health risk behaviors is complemented here with findings on study abroad participant health, traveler and expatriate health risks, and comparative U.S. general population health.

The studies identified concentrate on issues pertaining to the overall morbidity and mortality of these populations, as well as specific behavioral risks and risk perceptions or perceived norms that may influence risk-taking behavior while abroad. Specifically, these studies address sexual health risks, alcohol use and norms, cigarette smoking and drug use, and issues around sojourner adjustment and acculturation. The existing literature on these issues in populations traveling, living, working or studying abroad provides context and some insights into the less-studied population of Peace Corps Volunteers.

Alcohol use

While alcohol use among PCVs has not been specifically addressed in other studies conducted, Peace Corps' 2010 safety and security highlights stated,

> *Peace Corps statistics demonstrate that alcohol use is a contributing factor in many of the reported Volunteer incidents and excessive or frequent alcohol use significantly increases the likelihood that the Volunteer will become a crime victim* [7].

This statement indicates that alcohol use can be a problem during Peace Corps service, even though data on the number of alcohol-related incidents is not widely available. In

addition, the creation of a new subcategory in the 2008 *Health of the Volunteer* report titled, "Injuries: alcohol-related" [8], suggests that alcohol has played a role in PCV injuries - the most important cause of PCV mortality [9].

Pertaining to study abroad programs, three studies conducted by Pedersen et al. shed light on perceptions around cultural norms, as well as behavioral and personality factors, that may promote risk-taking with alcohol consumption while abroad. A 2009 study of 91 American study abroad students on perceived alcohol norms found that perceptions of student drinking in the U.S. before going abroad were correlated with actual drinking in those study abroad students – and that perceptions of higher alcohol consumption, independent of drinking intentions, predicted higher alcohol consumption [10]. In other words, if students believed – correctly or incorrectly – that the host culture in which they were staying drank more alcohol or drank alcohol more frequently, students would increase their own drinking behaviors to match their perceptions of that host culture.

Another exploratory longitudinal study of 177 students addressing factors affecting American drinking behaviors while abroad demonstrated that students increased their drinking overall by 105% while abroad, though this was moderated by region of study and age at pre-departure [11]. A third study by Pedersen et al. regarding drinking behaviors as they relate to self-selection into study abroad programs revealed that students who intended to study abroad had higher levels of alcohol consumption and related consequences than students with no intention of studying abroad [2]. These findings suggest that sensation-seeking qualities in young adults who are inclined to

study abroad may contribute to riskier alcohol-related activities than among their domestic peers.

Tobacco and marijuana use

A gap exists in literature to date regarding tobacco use and marijuana use trends among Peace Corps Volunteers. Current data from the CDC indicate that 19.3% of adults in the United States over the age of 18 smoke cigarettes, of which 21.5% are men and 17.3% are women [12]. These statistics may not, however, be applicable to the unique population of Peace Corps Volunteers, however, due to the contextual factors affecting tobacco use and initiation of use among different populations and subpopulations. These include socioeconomic status, race and ethnicity, and age [12], as well as a "…complex interplay of personal, social and cultural factors which can vary over time…"[13].

Marijuana use among Peace Corps Volunteers has also not been publicly documented. A 2008 study of marijuana use in 17 countries found that 42% of U.S. respondents in the U.S. had used marijuana in spite of punitive policies, compared with lower numbers in all other countries surveyed, with the exception of New Zealand [14]. However, it is unclear whether these data are also applicable to specific subpopulations of Americans living abroad, such as Peace Corps Volunteers. A prospective cohort study of UK university students who traveled abroad during summer holidays found that students who traveled internationally engaged in more cannabis smoking –as well as alcohol smoking and casual sex– during and following their time abroad [6].

Sexual risk behaviors and implications

Studies relating to the health of Americans living abroad from 1990 through 1998 focused primarily on sexual health, dominated primarily by the topic of HIV. A

prospective study on 282 PCVs residing in Zaire was conducted between 1985 and 1988, a region in which Hepatitis B and HIV were highly endemic. Upon service completion (mean length of 27.0 months), serum samples were analyzed, revealing 0 seroconversions to HIV among these volunteers, and 6.2% seropositivity for Hepatitis B (however, of these, 0 cases seroconverted during Peace Corps service). Risk of HIV and Hepatitis B acquisition among PCVs in Zaire during this time appeared to be minimal [15].

A similar cross-sectional study of PCVs in 18 West African countries corroborated the finding of low susceptibility to HIV types 1 and 2. Of the 2,491 PCVs surveyed, HIV-1 infections were reported in three volunteers – all of whom had engaged in unprotected sex with host country nationals [16]. These studies did not indicate increased susceptibility to HIV and Hepatitis B acquisition among PCVs.

In 1991, a cross-sectional survey of 1,242 PCVs in Eastern Europe, Central and South America, Sub-Saharan Africa, Asia and the Pacific found that 61% of PCVs reported having had at least one sex partner during their service, with less than one- third (32%) of unmarried PCVs reporting condom use at each sexual encounter [17]. Among males, lower alcohol use and belief that HIV was of concern in their country of service was associated with more frequent condom use; for females, being younger and having fewer sexual partners was associated with more frequent condom use [17].

The 2009 *Health of the Volunteer* report highlighted a rate of 3.7 STD cases/year among PCVs from 2008-2009, with a 91% increase in STD cases from 2008 to 2009 in one Eastern European country [18]. The 2010 *Health of the Volunteer* report indicated a 2% increase in incidence of STDs per year among PCVs since 2000, with a total of 258 cases diagnosed in 2010 [19].

Studies on expatriates and other travelers, as well as domestic U.S. citizens, may provide additional insights into issues affecting the sexual health of adults, working or otherwise living abroad. One study of 400 UK adults aged 18-34 who had traveled abroad identified differences in condom use consistency between males and females, showing that men were generally as consistent in their use of condoms abroad as they were at home, whereas women varied in consistency depending on prior knowledge of partners [20].

Data from the adult, domestic U.S. population concerning condom use and HIV risk provide further context. Based on a national survey of 9,270 adults, 21% (married and unmarried) reported condom use at their last sexual encounter, with a high of 62% among those having sex outside of a relationship compared to 19% of those having sex while in an established relationship [21]. These data from 1999 provide a snapshot of existing trends in condom use within the general U.S. population.

Water risks

Water is an increasingly scarce commodity in much of the developing world, with hundreds of millions of people worldwide currently lacking adequate access to improved sources of water [22]. Unsafe water, along with poor sanitation and hygiene, is a leading cause of diarrheal disease globally [23]. While very limited research has been conducted among PCVs on factors contributing to gastrointestinal problems, which is the leading cause of morbidity during Peace Corps service [8, 18, 19], two studies have specifically addressed water-related issues as they may affect this population.

One study addressed diarrheal disease among PCVs in Central America, finding the median number of diarrhea incidents to be 7 per person during Peace Corps service in

the cohort of 36 PCVs under study. One significant risk factor included water from unknown sources [24]. A second study addressed iodine excess among PCVs that occurred due to water filtration methods in Niger, West Africa [25]. A 2012 study on health risks to participants in international social projects (non-Peace Corps) found that two-thirds of those serving in Africa had inadequate access to safe water [26]. Findings from these studies suggest that access to potable water sources and water treatment methods likely have health implications for PCVs.

Transportation risks

In the U.S., one of the leading causes of death is motor vehicle accidents [27], and risk behaviors relating to unintentional injuries from such accidents is of interest both domestically and abroad. A glimpse into fatalities of Peace Corps Volunteers between the years of 1962-1983 in a 1985 retrospective study of 185 PCV deaths showed that 70% were attributed to unintentional injuries; among those, the principal cause of death was motor vehicle accidents [28].

More recent findings in the 2010 *Health of the Volunteer* report showed a decrease in unintentional injuries among PCVs, with motor-vehicle accidents accounting for only 3% of the 1,148 unintentional injuries reported in 2009 [19]. However, data on seatbelt use by PCVs serving in developing contexts, a behavior with pertinent safety implications, is not currently documented; this is also true of variation in seatbelt availability across regions in which PCVs serve. Previous studies on transportation trends among PCVs have also not addressed hitchhiking as a means of travel within or between countries – another behavior that may have implications for the safety of Americans living abroad.

General health

A 2008 retrospective study on PCV fatalities by Nurthen et al. found a decrease in volunteer deaths compared with the previous 20-year period, as well as a lower death rate compared with U.S. data from the same period [9]. The 66 deaths that took place out of the 71,198 PCVs who served from 1984-2003 were largely attributable to unintentional injuries (68.2%), though other causes of death included homicide (16.7%), medical illness (13.6%) and suicide (1.5%) [9]. With regard to morbidity, the Peace Corps' 2010 *Health of the Volunteer* report indicated that the most commonly reported health problems included gastrointestinal conditions, infectious dermatitis, and dental issues [19]. The extent to which risk behaviors have played a role in these health outcomes, which contribute to the overall morbidity and mortality of PCVs, has not previously been explored.

Perceptions of health risks while abroad

Perceptions of low risk and subsequent risk-taking behaviors have been documented in studies on study abroad participants, as well as International Red Cross volunteers, whereby low risk perceptions were associated with risk-taking behaviors. In a 2009 cross-sectional study of 318 study abroad students by Hartjes, students rated their mean perceived health risks as 1.7 on a 4-point scale [29]; the study indicated a gap in safety perceptions and inadequate preparedness for health and safety events that the students came to experience while abroad.

Another study on volunteers working abroad with the International Committee of the Red Cross found that 27% reported engaging in risk behaviors: these included 35%

not following recommendations regarding malaria prophylaxis and nearly one-third engaging in casual sex – with 64% reporting condom use at each occasion. Violence was experienced by16.2% of the volunteers, and another 10% experienced accidents or injuries [30].

Adjustment and acculturation in foreign contexts

Cultural cues, as they vary by country, may affect risk-taking behavior in Americans living, working or studying abroad. The influence of cultural norms – or perceptions of cultural norms – has been demonstrated to have an effect on drinking behaviors in study abroad students, according to Pedersen et al [31]. His study of 216 American study abroad students revealed that those who engaged in heaviest drinking behaviors among this population were those who were either highly assimilated and had perceptions of heavy drinking in the host culture, and those who were least assimilated and had perceptions of heavy drinking in other American study abroad students [31]. This study may have implications regarding the extent to which acculturation in Americans abroad affects the likelihood of engaging in alcohol-related risk behaviors.

The health of Peace Corps Volunteers

Statistics on PCV health as recent as 2008 state the major causes of morbidity and mortality in this population [8, 28], but do not address the extent to which PCVs' own risk behaviors may or may not contribute to these data. The behaviors addressed in existing literature on PCVs, study abroad program participants, travelers, and other international volunteer or expatriate groups are not comprehensive; other important behavioral causes of preventable morbidity and mortality – such as seatbelt use – have not yet been the subject of research in this population. Additionally, the issue of tobacco

use among PCVs, which continues to be the leading cause of preventable death in the U.S. [32], has not yet been investigated in this population.

Infectious and bacterial diseases, as they relate to water use and purification have also been only minimally addressed [24, 25], which is of concern considering that infectious diseases are the number one cause of PCV morbidity [8]. In addition, illegal drug use among PCVs has not been the subject of previous studies, and thus warrants further investigation.

This cross-sectional, exploratory study aims to address the extent to which PCVs engage in risk-taking behaviors relating to alcohol use, tobacco use, illegal drug use, safe sex, transportation and water purification, in order to glean clearer insight into those behaviors that warrant more comprehensive prevention efforts. Additionally, the extent to which PCVs engaged in these behaviors will be compared to self-reported levels of engagement prior to Peace Corps service in order to quantify the extent to which risk behaviors changed or stayed constant during Peace Corps.

Chapter 3: Data and Methods

Subjects

An original, web-based cross-sectional survey instrument, the *Peace Corps Health Risk Survey*, was designed between January and May, 2011. Expedited IRB approval was granted, and all participants gave informed consent to participate. Three hundred sixty-six returned Peace Corps Volunteers (RPCVs) responded to the survey. For inclusion in this study, participants had to be RPCVs over the age of 18 years, residing in the U.S., and who returned from Peace Corps between 2007 and 2012. RPCVs who

returned prior to 2007 or were not residing in the United States when the survey was administered were excluded from participation.

Sample

Due to lack of other means of reaching this population, a snowball sampling strategy was used, primarily through established non-profit RPCV group listservs. Such organized groups exist throughout the United States. The survey was sent to 12 such listservs located in all major regions of the contiguous United States, and the National Peace Corps Association additionally sent the survey to other RPCV group moderators. Individual RPCVs were also asked to forward the survey to their respective RPCV networks. This was a convenience sample, with no identifiers or geographical locators collected, and thus the results may not be applicable to all RPCVs or currently serving Peace Corps Volunteers. Data were collected between August and December, 2011, with a final sample size of 358.

Methods

To begin analyzing this data, first an exploratory analysis was conducted on each variable to identify implausible values. All variables had missing values. Eight respondents gave informed consent but did not answer any questions on the survey, and were therefore systematically eliminated from analysis –reducing the original sample size of 366 to 358. No other implausible responses were identified. Of the 44 variables, all were categorical with the exception of one variable, *number of sex partners* during Peace Corps, which was numerical and continuous. The *sex* (male/female) and *married at start of Peace Corps* (married/unmarried) variables were dichotomous. Questions pertaining to tobacco use, alcohol use, marijuana use, hitchhiking, sexual intercourse, and

contaminated water consumption before and during Peace Corps were dichotomous (yes/no) as well. *Country of service* and *religion* variables were nominal, and presented as a list of options for selection.

Variables pertaining to regularity of tobacco, alcohol, and marijuana use before and during Peace Corps service were on an ordinal scale ranging from *once or twice* to *daily*. Age at start of Peace Corps was organized on an interval scale in 5-year increments, ranging from 20 to 45 or older. Average units of alcohol consumed per occasion before and during Peace Corps service were discrete options ranging from *1* to *5 or more* units. Multiple nominal selections of whom participants drank alcohol with most frequently were possible. Availability/accessibility of alcohol and illegal drugs during Peace Corps were presented on an ordinal scale, including *unavailable/inaccessible*; *somewhat available*; *available, but only for men*; *available/accessible to men and women;* and *don't know*.

Social and cultural acceptability of alcohol consumption and sexual activity outside of marriage were also presented on an ordinal scale, ranging from *completely unacceptable or illegal* to *acceptable for men and women*; a *don't know* option was also offered. Changes in number of sex partners during compared to an equivalent period before departure were assessed on an ordinal scale of *fewer*, *more* or *the same* number of sex partners during Peace Corps. Times respondents had sexual intercourse without using a condom was measured on an interval of *0, 1-3 times, 4-6 times, 7-9 times* and *10 or more times* before and during Peace Corps. Four nominal options to ascertain whom participants engaged in sexual activity with during Peace Corps were offered: other

Americans (PCVs and non-PCVs), *Host Country Nationals*, and *travelers or expatriates from other countries*.

The period during Peace Corps when respondents were most sexually active was assessed on an interval scale of *months 1-6*, *months 7-12*, *months 13-18*, *months 19-24*, and *months 27 and beyond*. Regularity of seatbelt and helmet use before and during Peace Corps, as well as access to seatbelt use and treated water during Peace Corps were on ordinal scales ranging from *never* to *always*. The variables representing times respondents did not use a seatbelt during Peace Corps and times respondents knowingly drank untreated water were recorded on an interval scale ranging from *0* to *10 or more times*. Overall level of engagement in risk behavior during Peace Corps compared with before Peace Corps was nominal, with options of *increased*, *decreased*, or *stayed the same*.

Thirteen new variables were created to facilitate analysis when stratifying on potential risk factors, such as region, sex and age. The comparative number of sex partners during Peace Corps was dichotomized (*the same or fewer* versus *more* partners), as were whom PCVs engaged in sexual intercourse with (*Americans* versus *non-Americans*), and months in which PCVs were most sexually active (*months 1-12* versus *months 13+*). These three new variables were stratified by sex and chi-square tests were performed to assess statistical significance.

Reported countries of Peace Corps service were grouped into three large regions, as designated by Peace Corps: Europe, Mediterranean and Asia (EMA), Africa, and the Inter-America and Pacific region (IAP). In this study, the EMA region was represented by Albania, Armenia, Azerbaijan, Bulgaria, China, Georgia, Kazakhstan, Kyrgyz

Republic, Moldova, Morocco, Philippines, Romania, Thailand, Turkmenistan and Ukraine (n=113). The Africa region was comprised of Benin, Botswana, Burkina Faso, Cameroon, Ethiopia, The Gambia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Rwanda, Senegal, South Africa, Swaziland, Tanzania, Togo, Uganda and Zambia (n=129). The IAP region variable included Costa Rica, Dominican Republic, Ecuador, El Salvador, Fiji, Guatemala, Honduras, Jamaica, Micronesia and Palau, Nicaragua, Panama, Paraguay, Peru, Samoa, Tonga and Vanuatu (n=108).

Tobacco use regularity among tobacco users was dichotomized as *regular* (daily or weekly) versus *occasional* (less often than weekly), mean number of alcohol units per occasion was dichotomized as *<4* versus *4+*, and times having sex without a condom was dichotomized as *<10 times* versus *10+ times*. These variables were then stratified by each newly defined Peace Corps region, along with the already dichotomous *hitchhiking* variable.

Alcohol use among alcohol users was dichotomized as *regular* (daily or weekly) versus *occasional* (less often than weekly), and overall level of engagement in risk-taking behavior was dichotomized as *increased* versus *stayed the same or decreased*. With the majority of respondents under age 25 at the start of Peace Corps service, the age variable was also dichotomized as *<25* versus *25 or older*. This dichotomous age variable was then stratified by the *smoking, smoking regularity, alcohol use regularity, mean units of alcohol,* and *general risk-taking* dichotomized variables to assess potential differences between age groups with regard to these risk behaviors.

The primary outcome of interest in this study was changes in risk behaviors across all variables, as self-reported in pre- and during-service measures. Reported risk taking during Peace Corps, independent of reported behaviors prior to Peace Corps, served as a secondary outcome of interest.

Analysis

This study had two specific objectives: assessing changes in risk behaviors during Peace Corps service as compared to before Peace Corps service, and determining which risk behaviors were most prevalent among those evaluated. Additionally, differences in levels of engagement in specific risk behaviors across Peace Corps regions, age groups and gender were also of interest.

Descriptive statistics were conducted on all variables to highlight overall levels of engagement in each risk behavior. To assess whether marginal frequencies of engagement in specific behaviors were similar during Peace Corps, as compared to before, McNemar's chi-square analyses were performed on binary categorical pre- and during-service variables. These included tobacco use before and during, alcohol use before and during, and hitchhiking before and during Peace Corps service.

Paired t-tests were used where categorical variables were defined on an ordinal scale to capture whether statistically significant differences in reported behavior existed in Peace Corps compared with before. These variables included frequency of tobacco use, frequency of alcohol use, reported mean number of alcohol units imbibed per occasion, frequency of marijuana use, frequency of condom use, frequency of seatbelt use and frequency of helmet use. T-tests were used to calculate and compare mean scores of each variable in order to further illuminate aggregate-level changes. Whether risk behaviors

increased or decreased during Peace Corps is indicated as a percentage point change. Paired t-test p-values were reported at $\alpha=0.05$.

Reported risk behaviors during Peace Corps alone were also recorded, including multiple-choice options for those with whom PCVs most commonly drank alcohol. Reported frequencies of availability of alcohol, perceptions of cultural acceptability of alcohol, availability of illegal drugs, and cultural acceptability of sexual activity for unmarried people were also statistically described.

Sexual behaviors during Peace Corps were stratified by sex and analyzed using chi-square tests to report any significant differences between trends in males and females. These included pre-Peace Corps and during-Peace Corps levels of sexual activity, whom PCVs engaged in any type of intercourse with, and when participants reported they were most sexually active.

Seatbelt use and seatbelt availability during Peace Corps were descriptively contrasted to illuminate how contextual factors may play a role in risk behavior. In order to distinguish any potential regional variations, differences in frequencies of tobacco use, mean alcohol units, sex without condoms and hitchhiking before and during Peace Corps were descriptively compared across each Peace Corps region. However, stratified statistical tests could not be performed due to low cell counts rendering insufficient power for analysis across these variables.

Chi-square tests assessed statistical differences in risk behavior among those under 25 compared with those 25 years or older with regard to the following: tobacco use and frequency of use, alcohol use and quantity, and general risk-taking. All analyses were conducted at $\alpha=0.05$.

Results

Descriptive results from frequency analyses on baseline characteristics of the sample can be seen in **Table 1**. Females comprised 74.2% of the sample, and the majority of PCVs at the start of their Peace Corps service were between the ages of 20-24 (65.4%). Regarding religious traditions or spiritual backgrounds, 40.3% of respondents identified with Christianity, followed by 25.6% reporting no religion, and 13.4% reporting agnosticism. The vast majority of these RPCVs were unmarried during their service (89.9%). Respondents served in 54 countries, with 32.3% in the Europe, Mediterranean and Asia (EMA) region, 36.9% in the Africa region, and 30.9% in the Inter-America and Pacific (IAP) region.

Table 1: Sample demographics at start of Peace Corps

Characteristics n=358	n(%)		Characteristics N=358	n(%)
Female*	264(74.2%)		**Peace Corps region served***	
Unmarried*	319(89.9%)		Europe, Mediterranean and Asia (EMA)[a]	113(32.3%)
Religion*			Africa[b]	129(36.9%)
Christianity	142(40.3%)		Inter-America and Pacific (IAP)[c]	108(30.9%)
Judaism	6(1.7%)		**Age at start of Peace Corps***	
Islam	1(0.3%)		20-24	231(65.4%)
Hinduism	1(0.3%)		25-29	85(24.1%)
Buddhism	12(3.4%)		30-34	14(4%)
Agnosticism	47(13.4%)		35-39	3(0.9%)
Atheism	32(9.1%)		40-44	1(0.3%)
None	90(25.6%)		45+	19(5.4%)
Other	21(6%)			

*Missing values

As seen in **Table 2**, participants increased tobacco use during a 12-month period by 10.1%, from 38.6% as occasional or regular smokers before Peace Corps to 48.7% during Peace Corps (McNemar $p<0.001$). Overall alcohol use did not change significantly. Hitchhiking compared to any point in time prior to Peace Corps increased significantly during Peace Corps, by 68.5% (McNemar $p<0.001$).

Table 2. Reported aggregated behaviors before vs. during Peace Corps				
Variable n=358	**Before Peace Corps n(%)**	**During Peace Corps n(%)**	**McNemar p-value**	**Percent change during Peace Corps**
Tobacco used*	137(38.6%)	173(48.7%)	**<0.001**	+ 10.1%
Alcohol used*	332(94.3%)	334(95.7%)	**0.10**	+ 1.4% (not significant)
Hitchhiked*	31(9.3%)	263(77.8%)	**<0.001**	+ 68.5%

*Missing values

Table 3 illustrates individual-level changes in risk-taking behaviors that occurred during Peace Corps compared with the equivalent time period prior to Peace Corps, and whether those changes were statistically different. With regard to smoking frequency among participants who reported having ever smoked during an equivalent time-period prior to Peace Corps, a decrease occurred in those who smoked a few times a year or less beforehand. Those indicating smoking monthly, weekly or daily increased during Peace Corps. This was a significant change ($p=0.0002$). The overall mean value attributed to smoking frequency increased, indicating an aggregated increase in smoking frequency during Peace Corps.

Reported levels of alcohol use also changed significantly ($p<0.001$); weekly drinking decreased from 61.8% to 37.9% during Peace Corps, while monthly drinking increased by 15.6% (24.4% to 41%). However, those drinking 1 or fewer units alcohol at each drinking occasion decreased from 16.8% to 11.1%, while the those drinking 5 or more units of alcohol at each occasion increased from 3.4% to 12.6% ($p<0.001$) during Peace Corps. Comparing mean scores, overall frequency of alcohol use decreased during Peace Corps, while mean number of units per occasion increased.

Reported marijuana use before Peace Corps compared with during Peace Corps was marginally significant ($p=0.05$), with aggregated mean scores indicating a minor decrease in frequency of use. Condom use frequency did not change significantly. A

drastic change in seatbelt use during Peace Corps was reported, with 68.9% of RPCVs indicating *never* or *seldom* using seatbelts during Peace Corps versus 2.7% prior to Peace Corps ($p<0.001$). Of RPCVs, 96.1% reported *often or always* wearing a seatbelt prior to Peace Corps, compared with 16.6% *often or always* wearing a seatbelt during service. There was no statistical change in reported helmet use during Peace Corps while using a bicycle, motorcycle or moped. Concerning water use, 72% of PCVs reported having knowingly drunk potentially contaminated water during Peace Corps, with 35.5% reporting having done so on 10 or more occasions.

Table 5 highlights sexual activity overall and also stratified by sex (male and female). Of all participants, 20.1% reported having *more* sexual partners during Peace Corps than during the equivalent time period before, while 79.9% reported *the same number or fewer*. During Peace Corps, 32.2% of males reported having 'more' sexual partners than the equivalent period before, compared to 16% of females. This finding was significant ($p=0.001$).

Among participants, 76.2% reported having engaged in sexual intercourse (oral, anal or vaginal) during their Peace Corps service, with more males reporting having had sexual intercourse during Peace Corps (85.1%) than females (73.2%) ($p=0.024$). Regarding sexual partners, 62.7% reported sexual activity with other Americans, while 37.4% reported sexual activity with host country nationals (HCNs) or other non-Americans; there was no significant difference between males and females with respect to origins of partners. Overall, 69.2% of respondents reported that the majority of their sexual activity happened in the second year (or beyond) of Peace Corps service, with 30.8% indicating the majority of their sexual activity in months 1-12. The mean number

of sex partners reported overall was 2.48(SD 3.04), although males reported higher numbers than females: an average of 3.55 versus 2.14 ($p<0.001$).

Table 5. Risk behaviors during Peace Corps stratified by sex

Sexual behaviors n=358	Overall n(%)	Females n(%)	Males n(%)	Chi-square p-value
Comparative number of sex partners during Peace Corps compared with before				**0.0012**
The same or fewer	274(79.9%)	215(84%)	59(67.8%)	
More	69(20.1%)	41(16%)	28(32.2%)	
Sexually active during Peace Corps				**0.024**
Yes	262(76.2%)	188(73.2%)	74(85.1%)	
No	82(23.8%)	69(26.9%)	13(14.9%)	
Who PCVs engaged in sexual activity with				**0.16**
PCVs or other Americans	161(62.7%)	111(60%)	50(69.4%)	
Host Country Nationals or other non-Americans	96(37.4%)	74(40%)	22(30.1%)	
When most sexually active during Peace Corps				**0.20**
Months 1-12	66(30.8%)	52(33.3%)	14(24.1%)	
Months 13+	148(69.2%)	104(66.7%)	44(75.9%)	
Number of sexual events without using a condom				**0.09**
<10 times	180(70.3%)	135(73.5%)	45(62.5%)	
10+ times	76(29.7%)	49(26.6%)	27(37.5%)	
	Overall Mean(SD)	**Females Mean(SD)**	**Males Mean(SD)**	**p-value**
Number of sex partners during Peace Corps	2.48(3.04)	2.14(1.71)	3.55(4.99)	**<0.001**

*Missing values

With regard to transportation, 83.5% of PCVs reported not wearing a seatbelt on 10 or more occasions; however, 63.6% also reported that seatbelts were rarely or never available for use (**Table 6**). Descriptive statistics by each Peace Corps region on dichotomized risk behaviors before and during Peace Corps, along with percent change, can be seen in **Table 7**; however, due to low cell counts statistical tests were not performed.

Table 6. Non-seatbelt use during Peace Corps and availability by region

Variable n=358	n(%)		Variable n=358	Overall n(%)	EMA n(%)	Africa n(%)	IAP n(%)
Number of times without wearing a seatbelt during Peace Corps*			**Seatbelts an option During Peace Corps***				
0 times	9(2.7%)		**Never**	40(12.1%)	13(12%)	18(15.4%)	9(8.8%)
1-3 times	15(4.5%)		**Rarely**	180(54.2%)	51(47.2%)	68(58.1%)	58(56.9%)
4-6 times	20(6.0%)		**Occasionally**	72(21.7%)	28(25.9%)	25(21.4%)	17(16.7%)
7-9 times	11(3.3%)		**Most of the time**	33(9.9%)	13(12%)	4(3.4%)	16(15.7%)
10+ times	278(83.5%)		**Always**	7(2.1%)	3(2.8%)	2(1.7%)	2(2%)

*Missing values

Analyses on tobacco use and frequency of use, frequency of alcohol use and mean units per occasion, and general risk-taking were also stratified by age, grouped as under 25 and 25 or older at the start of Peace Corps service in **Table 8**. Among participants who were 25 or older, 11.5% fewer reported smoking during Peace Corps compared with those under 25 (p=0.04); however, those 25 and older reported more regular smoking (32% *weekly or daily*) than those under 25 (18.2%) (p=0.05). Alcohol intake frequency, alcohol units per occasion and overall risk-taking did not vary significantly between the two age groups.

Among all participants, 61.6% reported an increase in risk behaviors relating to personal safety and security while in Peace Corps compared to the 12 months prior to departure; 38.4% reported that their risk behaviors stayed the same or decreased during that time period.

Chapter 4: Discussion and Recommendations

Discussion

The principal objective of this study was to assess whether Peace Corps Volunteers' level of engagement in certain risk behaviors changed during Peace Corps service, compared to their engagement in the same risk behaviors prior to departure.

Overall, participants attested to an increase in their risk-taking behaviors during Peace Corps (61.6%). They reported statistically significant increases in general tobacco use ($p<0.001$), frequency of tobacco use ($p=0.0002$), and mean alcohol units consumed per occasion ($p<0.001$) compared with the 12-month period prior to Peace Corps.

Non-use of seatbelts also increased significantly ($p<0.001$), as did hitchhiking during Peace Corps ($p<0.001$). However, the study did not reveal significant change in certain risk behaviors: percentage of alcohol users, frequency of helmet use, and frequency of condom use did not vary significantly. A negligibly significant decrease in marijuana use was reported by participants ($p=0.052$), indicating that marijuana is likely not an important risk behavior for the majority of PCVs.

With regard to tobacco use, 10.1% more participants reported smoking either occasionally or regularly compared to the 12 months prior to departure ($p<0.001$). While a significant change in frequency of tobacco use among those reporting smoking existed ($p=0.0001$), analysis showed a 12.5% decrease in those who reported smoking *once or twice* or *a few times a year* (from 73% to 63.5%) and a 12.4% increase in those reporting *monthly*, *weekly* or *daily* smoking (from 27.1% to 39.5%). Reported daily smoking increased by 5.5%. By region, participants reported increases in regular tobacco use in EMA, Africa, and IAP.

While the number of participants reporting alcohol use during Peace Corps did not change significantly compared to the number reporting alcohol use in the 12 months prior to Peace Corps, participants reported statistically significant changes in the frequency of alcohol drinking ($p<0.001$), as well as mean units of alcohol consumed at each drinking occasion ($p<0.001$). Overall, the frequency declined during Peace Corps,

with 23.9% fewer weekly drinkers (61.8% before vs. 37.9% during); however, drinking on a monthly basis increased by 15.6% (25.4% vs. 41%), and daily drinking increased slightly by 2.4% (from 3.7% to 6.1%). The increase in monthly drinking and daily drinking is curious in contrast with the reported decrease in weekly drinking. Most alcohol drinking occurred on a monthly basis during Peace Corps (41%), potentially in conjunction with infrequent visits to other PCVs not living in nearby areas.

While overall PCVs reported drinking less frequently, the units of alcohol consumed at each occasion increased significantly ($p<0.001$). A 17.8% decrease in the number of participants drinking 2 or fewer units of alcohol per occasion on average was reported, and 17.6% more participants drank 3 or more units per occasion. Those reporting drinking 5 or more units of alcohol on average per occasion increased by 9.2% during Peace Corps (3.4% vs. 12.6%) ($p<0.001$). Increases in the percentage of PCVs drinking on average 4 or more units of alcohol per drinking occasion were reported in all regions. These findings illustrate that, while PCVs may drink alcohol less frequently during Peace Corps, they are more likely to engage in excessive alcohol consumption when they do drink. Reasons for excessive consumption of alcohol warrant further research, although other studies point to stress in conjunction with working abroad [33], elements of situational sensation-seeking [34], as well as other group norms and social motives [35] which may apply to PCVs.

This study also addressed some contextual aspects of Peace Corps service that may impact engagement in risk behaviors. The majority of participants indicated drinking alcohol most commonly with both Americans as well as HCNs, and 72.3% indicated that alcohol was available and accessible to both men and women during Peace Corps service.

Among participants, 52.6% also indicated that alcohol use was culturally and socially acceptable in their host countries. Availability of alcohol, social acceptability of its use in different countries of service, and tendencies for PCVs to drink with HCNs vs. other PCVs warrant further research in order to better understand how these cultural and social norms and practices may influence alcohol use and binge drinking behaviors among PCVs.

During Peace Corps, a 4.5% decrease in *weekly* and *daily* marijuana use (6.1% versus 1.8%) was reported. However, fewer people reported *never* using marijuana during Peace Corps compared to the 12 months prior (61.5% had never used before versus 59.2% during), and those reporting using marijuana *once or twice* increased by 6.3% ($p=0.052$). While regular use (weekly or daily) of this substance decreased in those who used marijuana regularly prior to Peace Corps, these data demonstrate that more individuals used marijuana *once or twice* during Peace Corps who had not used it in the 12 months prior. These findings suggest less regular use of marijuana during Peace Corps, but may have implications for increased initiation in previous non-users. The relative accessibility of marijuana may have been a factor.

In terms of perceived availability of illegal drugs, 19.9% of participants indicated that illegal drugs were *unavailable or inaccessible*, while 32.7% reported that they were *somewhat available*. Of participants, 13% reported that they were *available and accessible to men and women*; however, 32.1% also reported that they did not know about the availability or accessibility of illegal drugs in their countries of service.

A drastic shift occurred in seatbelt use, with the 90.2% of participants who reported *always* wearing seatbelts before Peace Corps dropping to 4.7% during Peace

Corps ($p<0.001$). While 2.7% of participants reported *never or rarely* wearing a seatbelt beforehand, more than two-thirds of volunteers (68.9%) reported *never or rarely* using seatbelts during Peace Corps. However, 66.3% of participants also reported that seatbelts were *never or rarely* available for use during Peace Corps (**Table 6**). Variations by region show the lowest seatbelt availability in Africa, followed by the IAP region, and then EMA.

A similarly drastic shift was seen in hitchhiking; 9.3% of participants reported hitchhiking at any point in time prior to Peace Corps, whereas 77.8% reported hitchhiking during Peace Corps ($p<0.001$) – an increase of 68.5%. Participants serving in all three Peace Corps regions reported increases in hitchhiking. Statistical significance could not be attributed to these reported changes across regions, however, due to inadequate statistical testing power. Inter- and intra-country variations in risk-taking behaviors should also be taken into account, as potentially substantial variations between and within countries likely exist with regard to normative behaviors and also infrastructural capacity and availability of viable means of transportation.

Given that gastrointestinal problems have been consistently the number one cause of morbidity among PCVs [8, 18, 19], health risk behaviors around water use and access to treated water were also of interest in this study. While pre-Peace Corps water use trends were not assessed, 72% of participants indicated that they had knowingly drunk contaminated water during Peace Corps, with 35.5% reporting having done so on 10 or more occasions. Considering that 80.8% of respondents reported having access to treated water during Peace Corps *most of the time* or *always*, these findings suggest that other contextual factors may be contributing to unsafe water drinking behaviors in PCVs.

There were statistically significant differences between males and females with regard to sexual behavior during Peace Corps, as well as level of overall engagement in sexual activity during Peace Corps. Sexual intercourse was reported by 85.1% of males during Peace Corps (oral, anal or vaginal), compared to 73.2% of females (p=0.024) – a 12.9% difference. Also, 32.2% of males reported having more sexual partners during Peace Corps than the 27 months before, compared with 16% of females (p=0.001) (**Table 5**). This suggests that, based on self-report, males are more likely to engage in sexual intercourse and to have sex with more partners during Peace Corps than females.

Participants were also asked about perceived cultural and social acceptability of sexual activity among unmarried people in their countries of service, given potentially different social paradigms that may have influenced sexual behaviors. 51.3% of participants reported that sexual activity among unmarried people was acceptable in their countries of service – but only for men, whereas 34.5% reported that it was culturally or socially acceptable for men and women. This discrepancy, at least in perceived norms, may be an indication of why male PCVs are more sexually active than female PCVs. A slight increase in number of participants indicating not using condoms on 10 or more occasions were seen in Africa and IAP, but a slight decrease was seen in EMA.

Pedersen et. al found that region and participant age served as modifying factors in drinking behaviors among college study abroad students [11], and therefore age was also considered as a potential factor affecting risk-taking behaviors. In this sample, 65.4% of volunteers were under 25 at the start of their Peace Corps service, and 89.5% were under 30 years old. Tobacco use (smoking) and frequency, alcohol use and frequency, units of alcohol per occasion, and general risk-taking were stratified by age of

PCVs (under 25 versus 25 or older at the start of Peace Corps) to assess whether significant differences existed between these age groups. Smoking (at any point during Peace Corps) was significant (p=0.04), with 52.8% of PCVs under 25 reporting having smoked, versus 41.3% of PCVs aged 25 or older reporting smoking. Smoking frequency was also marginally significant (p=0.05), with 32% of those 25 and older reporting regular smoking, compared with 18.2% of those 25 and under reporting regular smoking; however, missing data from this analysis may affect the validity of these findings.

The increase in tobacco use among those under 25 versus higher regularity of smoking in those 25 and older highlights the possibility that, while younger volunteers may be more inclined to experiment with smoking on an occasional basis during Peace Corps, volunteers who are older may be more likely to form regular smoking habits. Lifetime smoking patterns prior to, during and after Peace Corps – and likelihood of smoking reuptake during Peace Corps in former smokers – may be directions for future research.

In summary, key findings from this study indicate statistically significant **increases** in hitchhiking, number of tobacco users among PCVs, frequency of tobacco use, and units of alcohol consumed per occasion during Peace Corps. Statistically significant **decreases** were seen in frequency of alcohol use, seatbelt use, and marijuana use. Statistically significant **differences** were also reported between males and females with regard to sexual activity: males reported more sexual partners during Peace Corps than females, as well as higher rates of sexual intercourse. Corroborated by 61.6% of participants surveyed who indicated an increase in their engagement in risk behaviors

during Peace Corps, these findings strongly indicate a change in risk behaviors during Peace Corps as compared with before.

When considering the apparent change in the risk behaviors studied during Peace Corps service, it is also important to consider socio-contextual elements that may influence such behaviors. Acculturation stress and stress associated with work responsibilities may play a role in behaviors of PCVs. Previous research has found that expatriates and traveling business people commonly experience stress, diminished confidence and alcohol abuse while abroad [33, 36].

According to a 2011 survey of PCVs worldwide, 97% reported having some stress, with the top three sources of "considerable" or "exceptional" stress being primary assignment activities (24%), working with counterparts or community partners (21%), and feelings of isolation or loneliness (20%)[4]. 40% of participants in a study of international volunteers also reported that conditions were more stressful than they had anticipated [30]. Whether these stressors for PCVs translate into risk-taking behaviors requires further research, but contextual considerations such as sources of stress and acculturation while living abroad may provide direction for future studies.

Other socio-contextual factors, such as culture shock [37], perceived social status improvement [34], participation in group norms as they relate to alcohol use [38], and inadequate health information coupled with low perceived risks abroad [29, 39] are potential explanatory factors of increased risk-taking during Peace Corps.

Structural limitations within countries should also be taken into account when considering motivations for engagement in risk behaviors, as well as culture-bound definitions of risk and how those definitions may affect perceptions of safety and security

among PCVs. Structural limitations with regard to transportation (seatbelts, availability of helmets, social acceptability and utilization of hitchhiking) may encourage participation in behaviors that may not be considered risky within those particular settings—and which may even be necessary for daily functioning.

Limitations

This study is subject to limitations, including the potential for selection bias, response bias and recall bias. The snowball sampling strategy utilized rendered this a convenience sample, and thus findings are not generalizable to all RPCVs or currently serving PCVs. Mainly RPCVs belonging to non-profit organized RPCV groups in the U.S. participated in this survey, and these individuals may possess different characteristics than RPCVs not surveyed and who are not affiliated with such groups.

The survey used did not take into account differing lengths of Peace Corps service and how shortened or extended services may have impacted risk behaviors. The study also did not address the possibility that the "before Peace Corps" comparison period may, in certain participants, have been outside of the U.S. – and therefore subject to unique circumstances that may have affected risk behaviors prior to Peace Corps. In addition, the wording, limited scope and sensitivity of certain survey questions may have introduced social desirability response bias or nonresponse bias. Questions pertaining to sexual activity and condom use did not take into account monogamous, long-term or married relationships, nor same sex partnerships.

Missing values possibly influenced overall trends, and dichotomizing otherwise ordinal variables may have sacrificed the integrity of new variables created. In addition, stratified analysis by Peace Corps regions did not take into account inter- and intra-

country variations. The exploratory nature of this study limited the scope of this investigation: it did not address all potential risk behaviors encountered and engaged in by Peace Corps Volunteers or the context-specific circumstances that may affect risk behaviors.

Recommendations

An examination of how people behave when uprooted and whether changes in their behaviors are similar across populations and geographical locations are areas for future research. Whether those who choose to live in a different context are more or less able to adapt during the acculturation process than those without a choice may have also warrant more research. Considerations around social costs and benefits that affect engagement in risk behaviors abroad – such as potential health risks versus offending well-meaning hosts by not accepting suboptimal water, food or transportation – also may have implications for PCVs. The social consequences of such actions have the potential to significantly impact relationships, and therefore the ability to work productively and meaningfully, within host communities for the duration of a volunteer's Peace Corps experience.

In addition to future directions for research already noted, enhanced preventive and ongoing education for Americans living abroad is recommended. Increased training and health education resources addressing alcohol and tobacco use, country-specific safe transportation options, and water treatment options in different travel contexts are suggested, as well as targeted prevention efforts in regions and within age groups where risks are higher. As the most sexual activity among PCVs was reported during the second

year of Peace Corps service, a scaled up sexual education/prevention initiative at mid-service may also be considered.

The risks involved with living abroad cannot be entirely mitigated through behavior change. Structural limitations, different perceptions of risk and levels of risk acceptance in different cultural settings and other contextual factors beyond the control of the individual play critical roles in the safety and security of volunteers in international settings.

In spite of the inherent risks involved with living in a resource-constrained context for 27 months, it is also important to note that, accordingly to a 2011 survey of PCVs worldwide, 72% of PCVs in the field reported that Peace Corps had been "a personally rewarding experience," with another 86% affirming that they "would recommend Peace Corps to qualified interested parties" [4]. It would seem that, for the majority of PCVs, the benefits of Peace Corps service ultimately outweigh the risks.

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APPENDIX I: Tables

Table 1: Sample demographics at start of Peace Corps

Characteristics n=358	n(%)		Characteristics N=358	n(%)
Female*	264(74.2%)		**Peace Corps region served* ****	
Unmarried*	319(89.9%)		Europe, Mediterranean and Asia (EMA)[a]	113(32.3%)
Religion*			Africa[b]	129(36.9%)
Christianity	142(40.3%)		Inter-America and Pacific (IAP)[c]	108(30.9%)
Judaism	6(1.7%)		**Age at start of Peace Corps***	
Islam	1(0.3%)		20-24	231(65.4%)
Hinduism	1(0.3%)		25-29	85(24.1%)
Buddhism	12(3.4%)		30-34	14(4%)
Agnosticism	47(13.4%)		35-39	3(0.9%)
Atheism	32(9.1%)		40-44	1(0.3%)
None	90(25.6%)		45+	19(5.4%)
Other	21(6%)			

*Missing values

** Where 3 participants selected more than one country of service, the first alphabetically reported country was replaced by the second during region-stratified analysis

[a]**EMA region**: sample represented Albania, Armenia, Azerbaijan, Bulgaria, China, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Morocco, Philippines, Romania, Thailand, Turkmenistan, Ukraine

[b]**Africa region:** sample represented Benin, Botswana, Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Rwanda, Senegal, South Africa, Swaziland, Tanzania, the Gambia, Togo, Uganda, and Zambia

[c]**IAP region:** sample represented Costa Rica, Dominican Republic, Ecuador, El Salvador, Fiji, Guatemala, Honduras, Jamaica, Micronesia and Palau, Nicaragua, Panama, Paraguay, Peru, Samoa, Tonga and Vanuatu

Table 2. Reported aggregated behaviors before vs. during Peace Corps

Variable n=358	Before Peace Corps n(%)	During Peace Corps n(%)	McNemar p-value	Percent change during Peace Corps
Tobacco used*	137(38.6%)	173(48.7%)	**<0.001**	+ 10.1%
Alcohol used*	332(94.3%)	334(95.7%)	**0.10**	+ 1.4% (not significant)
Hitchhiked*	31(9.3%)	263(77.8%)	**<0.001**	+ 68.5%

*Missing values

Table 3a. Reported risk behaviors before and during Peace Corps							
Variable n=358	**Before Peace Corps n(%)**	**Mean score**	**During Peace Corps n(%)**	**Mean score**	**Mean difference**	**% change**	**p-value**
Frequency of tobacco use*		2.15		2.47	+0.32		**0.0002**
Once or twice- **1**	48(35.0%)		48(27.9%)			-7.1%	
A few times a year- **2**	52(38.0%)		56(32.6%)			-5.4%	
Monthly- **3**	15(11.0%)		30(17.4%)			+6.4%	
Weekly- **4**	12(8.8%)		16(9.3%)			+0.5%	
Daily- **5**	10(7.3%)		22(12.8%)			+5.5%	
Frequency of alcohol use*		3.58		3.34	-0.24		**<0.0001**
Once or twice- **1**	6(1.8%)		5(1.5%)			-0.3%	
A few times a year- **2**	24(7.3%)		44(13.5%)			+6.2%	
Monthly- **3**	83(25.4%)		134(41.0%)			+15.6%	
Weekly- **4**	202(61.8%)		124(37.9%)			-23.9%	
Daily- **5**	12(3.7%)		20(6.1%)			+2.4%	
Average number of alcohol units per drinking occasion*		2.43		2.88	+0.45		**<0.0001**
1 or fewer	55(16.8%)		37(11.1%)			-5.7%	
2 units	142(43.3%)		104(31.2%)			-12.1%	
3 units	77(23.5%)		95(28.5%)			+5%	
4 units	43(13.1%)		55(16.5%)			+3.4%	
5 or more units	11(3.4%)		42(12.6%)			+9.2%	
Frequency of marijuana use*		1.78		1.68	-0.10		**0.052**
Never- **1**	214(61.5%)		206(59.2%)			-2.3%	
Once or twice- **2**	54(15.5%)		76(21.8%)			+6.3%	
A few times a year- **3**	46(13.2%)		46(13.2%)			0%	
Monthly- **4**	13(3.7%)		14(4.0%)			+0.3%	
Weekly- **5**	17(4.9%)		4(1.2%)			-3.7%	
Daily- **6**	4(1.2%)		2(0.6%)			-0.6%	

*Missing values

Table 3b. Reported risk behaviors before and during Peace Corps (continued)

Variable n=358	Before Peace Corps n(%)	Mean score	During Peace Corps n(%)	Mean score	Mean difference	% change	p-value
Frequency of condom use*		2.49		2.65	+0.16		**0.07**
0 times- **1**	110(43.8%)		99(38.7%)			-5.1%	
1-3 times- **2**	54(21.5%)		57(22.3%)			+0.8%	
4-6 times- **3**	10(4.0%)		11(4.3%)			+0.3%	
7-9 times- **4**	8(3.2%)		13(5.1%)			+1.9%	
10 or more times- **5**	69(27.5%)		76(29.7%)			+2.2%	
Frequency of seatbelt use*		4.83		2.25	-2.58		**<0.0001**
Never- **1**	2(0.6%)		94(27.8%)			+27.2%	
Rarely- **2**	7(2.1%)		139(41.1%)			+39%	
Occasionally- **3**	4(1.2%)		49(14.5%)			+13.3%	
Most of the time- **4**	20(5.6%)		40(11.8%)			+6.2%	
Always- **5**	303(90.2%)		16(4.7%)			-85.5%	
Frequency of helmet use*		4.23		4.07	-0.16		**0.18**
Never - **1**	36(10.7%)		64(18.9%)			+8.2%	
Rarely- **2**	28(8.3%)		31(9.2%)			+0.9%	
Occasionally- **3**	26(7.7%)		24(7.1%)			-0.6%	
Most of the time- **4**	67(19.8%)		40(11.8%)			-8%	
Always- **5**	95(28.1%)		58(17.2%)			-10.9%	
Not applicable- **6**	86(25.4%)		121(35.8%)			+10.4%	

*Missing values

Table 4. Reported risk behaviors during Peace Corps

Variables n=358	n(%)	Variables n=358	n(%)
Who PCVs drank alcohol with (multiple options possible)*:		**Cultural/social acceptability of sexual activity for unmarried people***	
Other Americans	179(50.0%)	Completely unacceptable or illegal	35(10.1%)
Host Country Nationals (HCNs)	43(12.0%)	Acceptable, but only for men	177(51.3%)
Both Americans and HCNs	185(51.7%)	Acceptable for men and women	119(34.5%)
Alone	42(11.7%)	**Times knowingly drank potentially contaminated water during Peace Corps***	
Other people	16(4.5%)	0 times	74(21.9%)
Availability of alcohol*		1-3 times	86(25.4%)
Unavailable/inaccessible	22(6.4%)	4-6 times	42(12.4%)
Somewhat available	51(14.7%)	7-9 times	16(4.7%)
Available, but only to men	23(6.7%)	10+ times	120(35.5%)
Available/accessible to men and women	250(72.3%)	**Access to treated water during Peace Corps***	
Cultural/social acceptability of alcohol use*		Never	5(1.5%)
Completely unacceptable or illegal	29(8.4%)	Rarely	25(7.4%)
Acceptable, but only for men	133(38.4%)	Occasionally	35(10.4%)
Acceptable for men and women	182(52.6%)	Most of the time	198(58.8%)
Don't know	2(0.6%)	Always	74(22.0%)
Availability of illegal drugs*		**Knowingly drank potentially contaminated water during Peace Corps***	
Unavailable/inaccessible	69(19.9%)	Yes	242(72%)
Somewhat available	113(32.7%)	No	94(28%)
Available, but only to men	8(2.3%)		
Available/accessible to men and women	45(13.0%)		
Don't know	111(32.1%)		

*Missing values

Table 5. Risk behaviors during Peace Corps stratified by sex

Sexual behaviors n=358	Overall n(%)	Females n(%)	Males n(%)	Chi-square p-value
Comparative number of sex partners during Peace Corps compared with before				
The same or fewer	274(79.9%)	215(84%)	59(67.8%)	**0.0012**
More	69(20.1%)	41(16%)	28(32.2%)	
Sexually active during Peace Corps				
Yes	262(76.2%)	188(73.2%)	74(85.1%)	**0.024**
No	82(23.8%)	69(26.9%)	13(14.9%)	
Who PCVs engaged in sexual activity with				
PCVs or other Americans	161(62.7%)	111(60%)	50(69.4%)	**0.16**
Host Country Nationals or other non-Americans	96(37.4%)	74(40%)	22(30.1%)	
When most sexually active during Peace Corps				
Months 1-12	66(30.8%)	52(33.3%)	14(24.1%)	**0.20**
Months 13+	148(69.2%)	104(66.7%)	44(75.9%)	
Number of sexual events without using a condom				
<10 times	180(70.3%)	135(73.5%)	45(62.5%)	**0.09**
10+ times	76(29.7%)	49(26.6%)	27(37.5%)	
	Overall Mean(SD)	**Females Mean(SD)**	**Males Mean(SD)**	**p-value**
Number of sex partners during Peace Corps	2.48(3.04)	2.14(1.71)	3.55(4.99)	**<0.001**

*Missing values

Table 6. Non-seatbelt use during Peace Corps and availability by region

Variable n=358	n(%)	Variable n=358	Overall n(%)	EMA n(%)	Africa n(%)	IAP n(%)
Number of times without wearing a seatbelt during Peace Corps*		**Seatbelts an option During Peace Corps***				
0 times	9(2.7%)	**Never**	40(12.1%)	13(12%)	18(15.4%)	9(8.8%)
1-3 times	15(4.5%)	**Rarely**	180(54.2%)	51(47.2%)	68(58.1%)	58(56.9%)
4-6 times	20(6.0%)	**Occasionally**	72(21.7%)	28(25.9%)	25(21.4%)	17(16.7%)
7-9 times	11(3.3%)	**Most of the time**	33(9.9%)	13(12%)	4(3.4%)	16(15.7%)
10+ times	278(83.5%)	**Always**	7(2.1%)	3(2.8%)	2(1.7%)	2(2%)

*Missing values

Table 7. Differences in risk behaviors by Peace Corps region

Peace Corps Regions	Used tobacco daily or weekly*	4+ alcohol units per occasion*	10+ times sex without condoms*	Hitchhiked*
EMA* n=113	**n(%)**	**n(%)**	**n(%)**	**n(%)**
Before	8(18.2%)	14(13.9%)	22(27.9%)	9(8.3%)
During	14(24.1%)	25(24.5%)	23(28.8%)	76(69.1%)
% Change	+5.9%	+10.6	-0.9%	+60.8%
Africa* n=129	**n(%)**	**n(%)**	**n(%)**	**n(%)**
Before	7(12.7%)	21(17.7%)	23(25.3%)	10(8.4%)
During	15(24.6%)	46(37.1%)	27(28.7%)	106(88.3%)
% Change	+11.9%	+19.3%	+3.4%	+70.9%
IAP* n=108	**n(%)**	**n(%)**	**n(%)**	**n(%)**
Before	7(18.9%)	18(17.5%)	24(30.4%)	12(11.8%)
During	9(18%)	26(25.5%)	26(32.5%)	77(74.8%)
% Change	-0.9%	+8%	+2.1%	+63%

*Missing values

Table 8. Risk behaviors by age at the start of Peace Corps service

Behavior type	Overall n(%)	<25 years old n(%)	25+ years old n(%)	Chi-square p-value
Smoked during Peace Corps				**0.04**
Yes	173(48.7%)	122(52.8%)	50(41.3%)	
No	182(51.3%)	109(47.2%)	71(58.7%)	
Smoking frequency				**0.05****
Occasionally	134(77.9%)	99(81.8%)	34(68%)	
Regularly	38(22.1%)	22(18.2%)	16(32%)	
Alcohol frequency				**0.24**
Occasionally	183(56%)	124(58.2%)	57(51.4%)	
Regularly	144(44%)	89(41.8%)	54(48.7%)	
Alcohol units per occasion				**0.14**
3 or fewer	236(70.8%)	151(68.6%)	84(76.4%)	
4 or more	97(29.1%)	69(31.4%)	26(23.6%)	
General risk-taking				**0.79**
Increased	207(61.6%)	136(62.4%)	70(60.8%)	
Decreased or stayed the same	129(38.4%)	82(37.6%)	45(39.1%)	

***** Missing values
******52% of data missing

APPENDIX II: Peace Corps Health Risk Survey

Peace Corps Health Risk Survey

INFORMED CONSENT

Hubert Department of Global Health, Emory University 2012

The purpose of this research project is to learn more about those behaviors that may be of greatest risk to volunteers' health during Peace Corps service, and to better inform pre-departure health training and precautions taken. This is a research project being conducted by Amanda MacGurn (PCV Romania '09-'11), a graduate student at the Rollins School of Public Health at Emory University. You are invited to participate in this research project because you are a Returned Peace Corps Volunteer residing in the U.S, who returned from Peace Corps service between 2007 and 2012.

Please note: This survey is only meant for those volunteers who have returned from service between 2007 and 2012, and who are currently residing in the U.S.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. If you decide not to participate in this study or if you withdraw from participating at any time, you will not be penalized.

The procedure involves filling out an online survey that will take approximately 12-15 minutes. Your responses will be confidential and I do not collect identifying information such as your name, email address or IP address. The survey questions will be about health behaviors such as alcohol use, tobacco use, marijuana use, sexual behaviors and safety and security.

I will adhere to strict procedures in order to ensure confidentiality of information provided. All data is stored in a password protected electronic format on a personal computer with a different password. It is highly unlikely that I will be able to trace responses back to you. To help protect your confidentiality, the surveys will not contain information that will personally identify you by name, and contact information will not be collected. The results of this study will be used for scholarly purposes only and may be shared in aggregate form with Emory University and Peace Corps representatives, and also with you.

The risk involved with participating in this study is minimal. There is a chance that your confidential information could be breached. I will take every step possible toward decreasing this risk through the measures mentioned above. As sole researcher, file transferring and information sharing will not be required for this research. Data will not be stored on any external device, and therefore loss of information or misplacement and the potential for confidentiality breach in this regard will not be possible. Once the survey is completed, SSL encryption will enable information to arrive securely at SurveyMonkey servers, which are backed up daily. Information collected through SurveyMonkey surveys is held in strictest confidence, with physical and environmental controls in place to protect data. Please see the SurveyMonkey Privacy Policy for more information: http://www.surveymonkey.com/mp/policy/privacy-policy/. While your participation is highly valued for the purpose of this research, please understand that there are no direct benefits involved with participation in this study. If you have any questions about the research study, please contact Amanda MacGurn at amanda.macgurn@emory.edu. This research has been reviewed according to Emory University IRB procedures for research involving human subjects. If you would like to contact the Emory IRB with any questions or concerns, please call (404) 712-0720, or Toll Free at (877) 503-9797, or email IRB@emory.edu.

ELECTRONIC CONSENT: Please select your choice below to continue with the survey.

Clicking on the "agree" button below indicates that:

- you have ready the above information
- you voluntarily agree to participate

* you are at least 18 years of age
* you returned from Peace Corps service between 2007 and 2012
* you reside in the U.S. currently

***1. Do you agree to continue with this survey?**

◯ Agree

PART A: Demographic, Background Information and Beliefs

First I would like to ask you a few questions about your background, demographic information, and beliefs.

1. What is your gender?

◯ Female

◯ Male

Peace Corps Health Risk Survey

2. Which category below includes your age?

- ◯ 20-24
- ◯ 25-29
- ◯ 30-34
- ◯ 35-39
- ◯ 40-44
- ◯ 45 or older

3. How old were you at the start of your Peace Corps service?

- ◯ 20-24 years old
- ◯ 25-29 years old
- ◯ 30-34 years old
- ◯ 35-39 years old
- ◯ 40-44 years old
- ◯ 45 or older

Peace Corps Health Risk Survey

4. In which country or countries did you serve in the Peace Corps?

- ☐ Albania
- ☐ Armenia
- ☐ Azerbaijan
- ☐ Belize
- ☐ Benin
- ☐ Botswana
- ☐ Bulgaria
- ☐ Burkina Faso
- ☐ Cambodia
- ☐ Cameroon
- ☐ Cape Verde
- ☐ China
- ☐ Colombia
- ☐ Costa Rica
- ☐ Dominican Republic
- ☐ Eastern Caribbean
- ☐ Ecuador
- ☐ El Salvador
- ☐ Ethiopia
- ☐ Fiji
- ☐ Georgia
- ☐ Ghana
- ☐ Guatemala
- ☐ Guinea
- ☐ Guyana
- ☐ Honduras
- ☐ Indonesia
- ☐ Jamaica
- ☐ Jordan
- ☐ Kazakhstan
- ☐ Kenya
- ☐ Kyrgyz Republic
- ☐ Lesotho
- ☐ Liberia
- ☐

Peace Corps Health Risk Survey

- [ ] Macedonia
- [ ] Madagascar
- [ ] Malawi
- [ ] Mali
- [ ] Mauritania
- [ ] Mexico
- [ ] Micronesia and Palau
- [ ] Moldova
- [ ] Mongolia
- [ ] Morocco
- [ ] Mozambique
- [ ] Namibia
- [ ] Nicaragua
- [ ] Niger
- [ ] Panama
- [ ] Paraguay
- [ ] Peru
- [ ] Philippines
- [ ] Romania
- [ ] Rwanda
- [ ] Samoa
- [ ] Senegal
- [ ] Sierra Leone
- [ ] South Africa
- [ ] Suriname
- [ ] Swaziland
- [ ] Tanzania
- [ ] Thailand
- [ ] The Gambia
- [ ] Togo
- [ ] Tonga
- [ ] Turkmenistan
- [ ] Uganda
- [ ] Ukraine
- [ ] Vanuatu
- [ ] Zambia

Peace Corps Health Risk Survey

☐ Other (please specify)

5. What religion or philosophy, if any, did you identify yourself with during your service in the Peace Corps?

- ◯ Christianity
- ◯ Judaism
- ◯ Islam
- ◯ Hinduism
- ◯ Buddhism
- ◯ Agnosticism
- ◯ Atheism
- ◯ None
- ◯ Other

6. Were you married at any point during your Peace Corps service?

- ◯ Yes
- ◯ No

PART B: Substance Use

Now I would like to ask you some questions about your tobacco, alcohol and marijuana use before and during Peace Corps service.

1. In the 12 months prior to your Peace Corps service, did you ever smoke tobacco, including cigarettes, cigars, pipes or hookah (otherwise known as water pipe, nargileh or sheesha)?

- ◯ Yes
- ◯ No

1. How regularly did you smoke in the 12 months prior to your Peace Corps service?

- ◯ Once or twice
- ◯ A few times a year
- ◯ Monthly
- ◯ Weekly
- ◯ Daily

Peace Corps Health Risk Survey

2. During your Peace Corps service, did you ever smoke tobacco, including cigarettes, cigars, pipes, or hookah?

- ◯ Yes
- ◯ No

1. How regularly did you smoke tobacco during your Peace Corps service?

- ◯ Once or twice
- ◯ A few times a year
- ◯ Monthly
- ◯ Weekly
- ◯ Daily

2. In the 12 months prior to your Peace Corps service, did you ever drink alcohol?

- ◯ Yes
- ◯ No

1. In the 12 months prior to your Peace Corps service, how regularly did you drink alcohol?

- ◯ Once or twice
- ◯ A few times a year
- ◯ Monthly
- ◯ Weekly
- ◯ Daily

2. During the 12 months prior to your Peace Corps service, how many units of alcohol on average did you usually drink at each occasion?

One unit is equal to 12 ounces of beer, one small glass of wine, one shot of hard alcohol, or one mixed drink.

- ◯ 1 or fewer units
- ◯ 2 units
- ◯ 3 units
- ◯ 4 units
- ◯ 5 or more units

Peace Corps Health Risk Survey

3. During your Peace Corps service, did you ever drink alcohol?

- ◯ Yes
- ◯ No

1. During your Peace Corps service, how regularly did you consume alcohol?

- ◯ Once or twice
- ◯ A few times
- ◯ Monthly
- ◯ Weekly
- ◯ Daily

1. When you drank alcohol during your Peace Corps service, how many units of alcohol on average did you usually drink at each occasion?

One unit is equal to one 12 ounce beer, one small glass of wine, one shot of hard alcohol, or one mixed drink.

- ◯ 1 or fewer units
- ◯ 2 units
- ◯ 3 units
- ◯ 4 units
- ◯ 5 or more units

2. When you drank alcohol in your country of service, with whom did you usually drink?

- ☐ Other Americans
- ☐ Host Country Nationals
- ☐ Both Americans and Host Country Nationals
- ☐ Alone
- ☐ Other

Peace Corps Health Risk Survey

3. Think about the 12 months before you left for Peace Corps. How often, if ever, did you use marijuana?

- ◯ Never
- ◯ Once or twice
- ◯ A few times a year
- ◯ Monthly
- ◯ Weekly
- ◯ Daily

4. During your Peace Corps service, how often, if ever, did you use marijuana?

- ◯ Never
- ◯ Once or twice
- ◯ A few times a year
- ◯ Monthly
- ◯ Weekly
- ◯ Daily

PART C: Access

Now I'm going to ask you about access to substances, as well as cultural acceptance of certain behaviors.

1. During an average week in your Peace Corps service, how accessible/available was alcohol to you? This includes beer, wine and hard liquors.

- ◯ Unavailable/inaccessible
- ◯ Somewhat available
- ◯ Available, but only to men
- ◯ Available/accessible to men and women
- ◯ Don't know

2. During an average week in your Peace Corps service, how accessible/available were illegal drugs? This includes all drugs considered illegal in the United States.

- ◯ Unavailable/inaccessible
- ◯ Somewhat available
- ◯ Available, but only to men
- ◯ Available/accessible to men and women
- ◯ Don't know

Peace Corps Health Risk Survey

3. From your perception and experience in your country of service, how socially acceptable was alcohol consumption in that culture?

- ◯ Completely unacceptable or illegal
- ◯ Acceptable, but only for men
- ◯ Acceptable for men and women
- ◯ Don't know

4. From your perception and experience in your country of service, how socially acceptable was sexual activity (including any type of intercourse) for unmarried or single people?

- ◯ Completely unacceptable or illegal
- ◯ Acceptable, but only for men
- ◯ Acceptable for men and women
- ◯ Don't know

PART D: Sexual behaviors

Now I'm going to ask you about your sexual behaviors before and during Peace Corps service.

1. Think about your sexual activity during Peace Corps compared with the 27 months (or equivalent time of your Peace Corps service) before you left. During your Peace Corps service did you have fewer, more, or the same number of sexual partners than the equivalent time period before you left for Peace Corps?

- ◯ Fewer
- ◯ More
- ◯ The same

2. Did you have vaginal, oral, or anal sexual intercourse during your Peace Corps service?

- ◯ Yes
- ◯ No

1. During your Peace Corps service, how many sexual partners did you have total?

This includes vaginal, oral and anal intercourse.

Approximate number of partners: _____

Peace Corps Health Risk Survey

2. In the 27 months before your Peace Corps service (or equivalent amount of time to your length of Peace Corps service), about how many times did you have sexual intercourse (oral, vaginal or anal) without using a condom?

- ◯ 0 times
- ◯ 1-3 times
- ◯ 4-6 times
- ◯ 7-9 times
- ◯ 10 or more times

3. During your Peace Corps service (entire duration), about how many times did you have sex (oral, anal or vaginal) without using a condom?

- ◯ 0 times
- ◯ 1-3 times
- ◯ 4-6 times
- ◯ 7-9 times
- ◯ 10 or more times

4. Which of the following best represents who you most often engaged in sexual activity with?

- ◯ Peace Corps Volunteers
- ◯ Americans who were not PCVs
- ◯ Host Country Nationals
- ◯ Travelers or expatriates from other countries

5. During which period of your Peace Corps service were you the most sexually active?

- ◯ Months 1-6
- ◯ Months 7-12
- ◯ Months 13-18
- ◯ Months 19-24
- ◯ Months 27 and beyond

PART E: Safety

This section is about behaviors related to transportation and water consumption.

Peace Corps Health Risk Survey

1. In the 12 months prior to your Peace Corps service, how regularly did you wear a seatbelt when riding in a car, van or truck?

- ◯ Never
- ◯ Seldom
- ◯ Occasionally
- ◯ Often
- ◯ Always

2. During your Peace Corps service, how regularly did you wear a seatbelt when riding in a car, van or truck?

- ◯ Never
- ◯ Seldom
- ◯ Occasionally
- ◯ Often
- ◯ Always

3. During your Peace Corps service, how many times did you ride in a car, van or truck without wearing a seatbelt?

- ◯ 0 times
- ◯ 1-3 times
- ◯ 4-6 times
- ◯ 7-9 times
- ◯ 10 or more times

4. How often was it an option for you to wear a seatbelt while riding in a car, van or truck during your Peace Corps service?

- ◯ Never
- ◯ Rarely
- ◯ Occasionally
- ◯ Most of the time
- ◯ Always

5. Did you ever hitchhike in the U.S. prior to your Peace Corps service?

- ◯ Yes
- ◯ No
- ◯ I did not live in the U.S. at that time

Peace Corps Health Risk Survey

6. During your Peace Corps service, did you ever hitchhike?

- ◯ Yes
- ◯ No

7. If you ever rode a bicycle, moped or motorcycle in the 2-3 years prior to your Peace Corps service, how often did you wear a helmet?

- ◯ Never
- ◯ Rarely
- ◯ Occasionally
- ◯ Most of the time
- ◯ Always
- ◯ Did not ride a bicycle, moped or motorcycle in the 2-3 years prior to Peace Corps service

8. If you ever rode a bicycle, motorcycle or moped during your Peace Corps service, how often did you wear a helmet when riding a bicycle, moped or motorcycle?

- ◯ Never
- ◯ Rarely
- ◯ Occasionally
- ◯ Most of the time
- ◯ Always
- ◯ Did not ride a bicycle, moped or motorcycle during Peace Corps service

9. During your Peace Corps service, did you ever drink untreated or unpurified water, which could have been contaminated by toxic substances and/or harmful germs?

- ◯ Yes
- ◯ No

10. During your Peace Corps service, how often did you have access to purified or treated water?

- ◯ Never
- ◯ Rarely
- ◯ Occasionally
- ◯ Most of the time
- ◯ Always

Peace Corps Health Risk Survey

11. On approximately how many occasions did you drink water that you knew was untreated or unpurified during your Peace Corps service?

- ◯ 0 times
- ◯ 1-3 times
- ◯ 4-6 times
- ◯ 7-9 times
- ◯ 10 or more times

PART F: Overall safety and security

This last question is related to your overall safety and security during Peace Corps service.

1. In general, would you say that your level of engagement in risk behaviors relating to personal safety and security increased, decreased or stayed the same during your Peace Corps service, compared with the 12 months prior to your departure?

- ◯ Increased
- ◯ Decreased
- ◯ Stayed the same

APPENDIX III: IRB Approval

EMORY UNIVERSITY | Institutional Review Board

TO: Amanda MacGurn
Principal Investigator
Public Health

DATE: Thursday, August 2, 2012

RE: **Expedited Approval**
IRB00058624
Peace Corps Volunteer Health Risk Survey

Thank you for submitting a new application for this protocol. This research is eligible for expedited review under 45 CFR.46.110 and/or 21 CFR 56.110 because it poses minimal risk and fits the regulatory category F[7] as set forth in the Federal Register. The Emory IRB reviewed it by expedited process on 7/31/2012 and granted approval effective from **7/31/2012** through **7/30/2013**. Thereafter, continuation of human subjects research activities requires the submission of a renewal application, which must be reviewed and approved by the IRB prior to the expiration date noted above. Please note carefully the following items with respect to this approval:

- The approved consent form is Version: 7/27/2012
- The approved protocol is Version: 7/27/2012
- CITI Certification must be refreshed every two years. If you plan to continue your project after 7/18/2013, a CITI refresher course will need to be taken.
- Due to the sensitive nature of the questions being asked, please do everything possible to ensure that confidentiality is not breached.

Any reportable events (e.g., unanticipated problems involving risk to subjects or others, noncompliance, breaches of confidentiality, HIPAA violations, protocol deviations) must be reported to the IRB according to our Policies & Procedures at www.irb.emory.edu, immediately, promptly, or periodically. Be sure to check the reporting guidance and contact us if you have questions. Terms and conditions of sponsors, if any, also apply to reporting.

Before implementing any change to this protocol (including but not limited to sample size, informed consent, study design, you must submit an amendment request and secure IRB approval.

In future correspondence about this matter, please refer to the IRB file ID, name of the Principal Investigator, and study title. Thank you

Michael Arenson, MA
Analyst Assistant

This letter has been digitally signed

CC: MacGurn Amanda Public Health