Long-term Health Outcomes of Peace Corps Volunteers

Investigators and Responsibilities

Name	Title, Affiliation	Roles and Responsibilities
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Susan Henderson, MD MPH	Epidemiologist, Peace Corps	Investigator. Technical assistance for study development, review and edit protocol, provide technical assistance for study implementation and analysis, review and edit abstract and manuscript
Jodi Vanden Eng, MS	Biostatistician, CDC	Investigator. Technical assistance for analytic plan in protocol, data cleaning and management, complex data analysis, review abstract and manuscript (especially analytic methods and results sections)
Tom Wilkinson, MD	Medical Officer, Peace Corps	Investigator. Review protocol, review abstract and manuscript
Paul Jung, MD	Associate Director, Peace Corps	Investigator. Review protocol, review abstract and manuscript
Rennie Ferguson	Epidemiologist, Peace Corps	Study implementer and data manager. Manages database of returned Volunteers, assists with study implementation, specifically disseminating survey link to returned Volunteers.
Paul Arguin, MD	Domestic Unit Team Lead, CDC	Senior author, co-principal investigator. Review protocol, provide technical support and subject matter expertise for study implementation and data analysis, review manuscript

Summary

Adherence to chemoprophylaxis in long-term travelers like Peace Corps Volunteers (PCVs) is a challenge, and a previous survey of PCVs found that fear of latent side effects (diseases that might develop years after taking antimalarials for prolonged periods of time) was one of the top factors associated with nonadherence. There is a dearth of studies on the risk of latent effects of prophylaxis. The multi-year deployment of PCVs to malaria-endemic areas presents a good opportunity to examine if long-term malaria prophylaxis puts users at higher risk of developing certain diseases in the future. The results of such a study would provide some evidence with which to address fears of latent side effects in order to improve adherence to malaria prophylaxis. We propose to determine if use of malaria chemoprophylaxis among PCVs is associated with long-term health outcomes. A matched-cohort study

is proposed, in which PCVs who completed service between 1995–2014 will be surveyed using an internet-based questionnaire. Risk for developing disease will be compared between those who took prophylaxis and those who did not. Data dissemination will take the form of a report to Peace Corps, abstract submitted to an international conference, and a manuscript submitted to a peer-reviewed journal.

I. Background and Rationale

Malaria chemoprophylaxis is a key strategy for preventing malaria when traveling to malaria-endemic areas. Long-term travelers (those traveling for 6 or more months) to malaria-endemic areas have reported poor adherence to malaria prophylaxis, and a literature review found that 15-82% of long-term travelers to Africa reported getting malaria.[1, 2] Reasons cited for poor adherence have included fear of long-term adverse events, conflicting advice, and complicated dosing strategies.[1] An example of long-term travelers on antimalarials for an extended period of time, are Peace Corps Volunteers (PCVs), who are posted internationally for at least two years. A recent survey of Peace Corps Volunteers serving in malaria-endemic areas in Africa found that fear of latent side effects (i.e. disease that might develop after discontinuing antimalarials) was one of the top reasons for non-adherence to prophylaxis.[3]

The latent adverse effects of long-term malaria prophylaxis are not well known, and if any exist, these effects would vary by drug. Most of the literature available examines side effects experienced during, not after, long-term use of some, but not all, of the antimalarials.[4, 5, 6] There is some limited evidence in the literature of persistent adverse events, that is, adverse events that start while taking the drug and persist even after discontinuation. For example, use of chloroquine at 250 mg/day for more than 5 years is associated with an estimated 1% risk of developing oculotoxicity, which may progress even after discontinuation of the drug;[7] however usual prophylaxis dosing is weekly. For mefloquine, there have been rare case reports of persistent dizziness despite discontinuation.[8] Furthermore, the definition of "long-term" use may vary from less than 6 months to years of use in different studies.[6, 9] There are no studies on the latent effects of long-term malaria prophylaxis.

The multi-year deployment of PCVs to malaria-endemic areas presents a good opportunity to examine if long-term malaria prophylaxis puts users at higher risk of developing certain diseases in the future. The results of such a study would provide some evidence with which to address fears of latent effects of malaria prophylaxis in order to improve adherence among long-term travelers such as PCVs.

Furthermore, PCVs usually serve in challenging conditions with potential exposures that might put them at risk for other diseases, and the safety and health of PCVs is a priority for Peace Corps. While the data generated in this proposed study will not be comprehensive for exposures, many health outcomes will be collected. The data generated from this study can help Peace Corps understand long-term health outcomes of PCVs in terms of prevalence of select diseases in comparison to the general US population.

Objectives

1. To determine whether or not use of malaria chemoprophylaxis increases risk of developing various diseases among former PCVs.
2. To describe the prevalence of select diseases among returned PCVs in comparison to the general US population.

II. Methods

Study population

Inclusion criteria are broad in that all PCVs who served between 1995–2014 will be invited and are eligible to participate.

Study design

A matched-cohort study is proposed. An anonymous, internet-based survey will be disseminated to returned PCVs. Because self-reported symptoms might not be as dependable, the study will focus on actual diagnoses that were made before, during and after taking malaria prophylaxis. Diagnoses made after leaving Peace Corps will be described in respondents as a whole. Then, the risk of developing these disease diagnoses will be compared among those who took any malaria prophylaxis to those who did not take prophylaxis using 1:3 matching. The study will focus on select diseases (see outcomes of interest below). Because we do not want to bias responses to the survey by highlighting adverse events and malaria prophylaxis, the consent form, as well as the questions in the survey, will emphasize the broader purpose of looking at disease outcomes in general.

Sampling and sample size

If one person who took prophylaxis is matched to three people who did not, and aiming for a study with power=0.80 and an alpha=0.05, the exact sample size needed would depend on the prevalence of disease, and how big of a difference between the two groups we would like to detect. For example, if we wanted to be able to detect a 25% difference between the two groups in the prevalence of a more common disease, like coronary heart disease with a prevalence of about 6% in the general population, the sample size needed would be about 3,320 people who took prophylaxis and 9,960 people who did not take prophylaxis. To maximize sample size, all PCVs in the database will be invited to participate. Peace Corps maintains a database of returned PCVs with 65,000 PCVs who served between 1995–2014. It is also possible that for some returned PCVs, especially the ones who served further in the past, the contact information is not up to date. To try to get at these returned PCVs, we will also do respondent-driven sampling. PCVs contacted via email stored in the returned PCV database will be asked to invite other PCVs who they might know to participate in the survey. To invite others, the participant can forward the invitation email containing a link to the survey.

Outcomes of interest

The outcomes of interest are self-reported diseases diagnosed by a medical professional, requiring ongoing management or medication, and with an onset after leaving Peace Corps and select non-medical outcomes (the need to wear glasses/contacts, and social indicators like marital/partnership

status and employment), reported since completing malaria prophylaxis. The disease diagnoses of particular interest will be based on feared long-term adverse events reported in a prior survey of PCVs [3], and those extrapolated from known or suspected adverse events of antimalarials. In the prior survey, the top-feared latent adverse effects due to malaria prophylaxis were: neuropsychiatric events (depression, anxiety, and insomnia), cancer (unspecified), and "sun sensitivity". So the diagnoses to be examined will include depression, anxiety, insomnia, and select cancers including skin cancer. As for diagnoses of interest related to known or suspected adverse events of antimalarials, we will examine the following. Mefloquine is known to cause neuropsychiatric adverse events in 10-15% of those taking it, so diagnoses such as dementia, depression, vestibular dysfunction, seizures, or psychoses would be of interest. Melfoquine is also known to affect cardiac conductivity resulting in arrhythmias, so cardiac diagnoses such as arrhythmias, myocardial infarction, and congestive heart failure will be examined. Doxycycline is known to cause gastrointestinal disturbances so gastric, duodenal, or esophageal ulcers would be of interest, as well as recurrent yeast infections. Chloroquine has been associated with pruritus and rash, so dermatologic conditions such as psoriasis will be of interest. Long-term use of chloroquine has been associated with oculotoxicity, which will also be examined. For malarone, abnormal liver function tests have been reported with use, so fatty liver, cirrhosis, liver failure, and liver cancer will be examined. Non-medical outcomes such as wearing glasses/contacts or social indicators like divorce or employment will be used as indirect indicators of long-term health effects.

Because these outcomes could also be associated with predisposing conditions and could result from other exposures, factors such as diagnoses while in Peace Corps, habits (smoking, drinking, and exercising), assignment while in Peace Corps, and occupation will be asked.

Data collection and pilot testing of instrument

An internet-based survey will be created on Survey Monkey (Appendix A). Questions to be asked include: country served, whether or not prophylaxis was required at assigned site; prophylactic drug taken; length of time on the drug; when prophylaxis was stopped; degree of adherence; select medical diagnoses during and since leaving Peace Corps; medications; habits; and demographics.

This survey will be pilot tested among 10 returned PCVs to determine clarity of questions as well as length of time to complete. Based on this pilot test, the data collection instrument will be further refined. The data collection instrument in Appendix A has the totality of the scope of questions to be asked. The pilot will be used to either refine wording of the questions for clarity, or to cut out questions if too lengthy; no questions beyond the scope of the survey in Appendix A will be added.

The Peace Corps data manager will disseminate a link to the survey to the returned PCVs in their database. Each returned PCV will be emailed a unique ID number. These returned PCVs will be asked to invite other returned PCVs whom they might know to take the survey, and to use the same ID number. To maximize response rate, a reminder email containing a link to the survey and the unique ID number will be sent two and four weeks after the initial email. After the survey link is e-mailed, the Peace Corps data manager will destroy any documentation of ID numbers. The purpose of the ID number is to anonymously link groups of invited PCVs together so that we know the proportion of participants

sampled via respondent driven sampling versus those in the original Peace-Corps-originated invitation. This will be useful to get the response rate for the original invitation. When the surveys are completed, Survey Monkey sends the data directly to CDC.

Aggregate data on demographics (age, sex) of the returned PCVs invited to do the survey will be provided by Peace Corps.

Data management

Data from completed surveys will be sent from Survey Monkey directly to CDC, so it will have no identifying data. CDC will house, manage, and clean the database. Once the main objectives of the study have been completed, the dataset will be maintained by CDC for future analytic interests. Any additional analyses or proposed secondary manuscripts beyond the scope of this protocol will require a written proposal outlining the rationale, objectives, analytical methods, and data dissemination plans, and must be approved by the investigators at both Peace Corps and CDC.

Data analysis

Data will be analyzed using SAS v9.3. Response rate will be calculated. Representativeness of our sample will be examined by comparing the demographics of our sample to the aggregate demographic data of PCVs serving 1995–2014 obtained from Peace Corps.

The exposure of interest is malaria prophylaxis, and outcomes of interest are select disease diagnoses. Volunteers who took malaria prophylaxis will be matched to volunteers who took no prophylaxis at a 1:3 ratio based on age, and gender. Demographics and characteristics of these two groups will be described and compared. Then, risk for developing a disease will be compared between those who took prophylaxis and those who didn't. This risk of disease will be stratified by type of antimalarial. To see if those who took prophylaxis might be at risk for developing certain diseases sooner, we will examine time between finishing Peace Corps (1 month after finishing) and development of disease among those who took prophylaxis and those that did not.

For the secondary objective, prevalence of select diseases among returned PCVs will be compared to those of the general US population within the same age, sex, and ethnic categories when appropriate.

III. Ethical issues

Consent

The consent form (Appendix B) will appear prior to starting the survey. Only those who consent will be allowed to proceed with the survey.

Confidentiality

Peace Corps will e-mail a link to the survey using their database of returned PCVs. Each PCV will be given a random ID number to enter into the online data form, but those invited via respondent driven sampling will use the same ID number as the inviter. After the emails are sent out to the returned PCVs, this list of random ID numbers will be destroyed. No identifying or contact information of returned PCVs will be given to CDC. Surveys will also not collect identifying information. When surveys are completed, Survey Monkey sends the anonymous data directly to CDC. There will be no link between the survey responses and participants' e-mail or identity.

Risks and adverse events

There is minimal risk to participation in this survey as it is anonymous, but there may be some discomfort with answering personal questions about one's health.

Participant incentives

No incentives will be given to survey participants.

IV. Dissemination of Findings

Findings will be presented to Peace Corps via both a presentation and a more detailed written report. An abstract will also be submitted to a scientific conference, and a manuscript will be submitted to a peer-reviewed journal.

V. Timeline

Activity	Dates
Protocol development and ethics clearance	April 2014–June 2015
Office of Management and Budget clearance* (and pilot testing of survey)	June–December 2015
Study implementation	February 2016
Data analysis	March-April 2016
Report writing and CDC clearance	May–August 2016
Data dissemination	August 2016

* It will take 3-4 weeks to complete OMB paperwork, then once submitted, the length of time required for clearance will be at least 6 months.

Appendix A: Survey to be administered via Survey Monkey. Goal is a less than 15-minute survey to optimize response. Skip patterns will be used to minimize time. Flesch– Kincaid Reading Level : 12+

Peace Corps has partnered with the Centers for Disease Control and Prevention to determine what the long term health effects of Peace Corps service, if any, are. The investigators have developed an online survey for returned Peace Corps Volunteers to complete. This survey will help us better understand the long-term quality of health of Volunteers after leaving Peace Corps.

The following questions are about your time as a Peace Corps Volunteer.

1. In what country did you serve as a Peace Corps Volunteer? If you served in more than one country, please list the country that you served in first (Drop down menu with list of countries,
2. When did you start your Peace Corps training in that country? (MM/YYYY)
3. When did you finish your Peace Corps Service, either by COS/ ET/ Medical Separation/ Evacuation in that country? (MM/YYYY)
4. What was your primary work assignment as a Peace Corps Volunteer?
    a. Education
    b. Agriculture
    c. Community economic development
    d. Youth in development
    e. Environment
    f. Health
    g. Other (specify)
5. What best describes the location of your assignment?
    a. Rural (Less than 1,000 people per square mile. Ex: village or town with dirt roads)
    b. Urban (1,000 or more people per square mile. Ex: capital city of the country)
6. While in Peace Corps, were you exposed to cook fires or cook stoves:
    a. No (skip questions below)
    b. Yes, indoors
    c. Yes, outdoors
    d. Yes, both indoors and outdoors
        a) (If answer is b, c, or d above) How many hours/week were you exposed? _____ hrs/wk
7. While in Peace Corps, what were the two main water safety measures, if any, did you take? a)iodine tablets b)boiled water c) filtered water using a Peace Corps approved filter d) other (specify) e) not applicable f) none
8. What statement best describes your use of mosquito repellent during Peace Corps:
    a. I used a DEET-containing mosquito repellent every day.
    b. I used some type of mosquito repellent every day.
    c. I used a DEET-containing mosquito repellent most days.
    d. I used some type of mosquito repellent most days.
    e. I used a DEET-containing mosquito repellent some days.
    f. I used some type of mosquito repellent some days.

g. I used a DEET-containing mosquito repellent rarely (less than once a week).
h. I used some type of mosquito repellent rarely (less than once a week).
i. I never used a mosquito repellent.

9. While in the Peace Corps, were you ever diagnosed by a Peace Corps Medical Officer with the following: (checkboxes)

Skin problems (select any that apply): None ( )

( ) Acne

( ) Allergic dermatitis (allergic rash)

( ) Contact dermatitis (rash from contact with something)

( ) Fungal infection of skin (also called "ring worm")

( ) Skin cancer

( ) Psoriasis

( ) Other (specify)_____

Heart or circulation problems (select any that apply): None ( )

( ) Arrhythmia

( ) Cardiomyopathy

( ) Congestive heart failure

( ) Hypertension (high blood pressure)

( ) Myocardial infarction (heart attack)

( ) Other (specify) _____

Gastrointestinal or stomach problems (select any that apply): None ( )

( ) Amoebas

( ) Crohn's disease or inflammatory bowel disease

( ) Cirrhosis

( ) Duodenal ulcers

( ) Esophageal ulcers

( ) Fatty liver

( ) Gastroenteritis, unspecified

( ) Gastroesophageal reflux (GERD) or heartburn

( ) Giardia

( ) Irritable bowel syndrome (IBS)

( ) Liver failure

( ) Peptic Ulcers

( ) Roundworms/helminths

( ) Other (specify)_____

Genital, reproductive, or urinary tract problems (select any that apply): None ( )

( ) Abnormal PAP smear

( ) Miscarriage(s)

( ) Urinary tract infection(s)

( ) Vaginal yeast infection(s)

( ) Other (specify)_____

Immunologic, rheumatologic, or oncologic (cancer) problems such as (select any that apply): None ( )

( ) Breast cancer

( ) Gastric cancer

( )Leukemia

( ) Liver cancer

( ) Lymphoma

( ) Osteoarthritis

( ) Prostate cancer

( ) Rheumatoid arthritis

( ) Other (specify)_____

Infectious diseases (select any that apply): None ( )

( ) Amoebas

( ) Antibiotic resistant infections

( ) Chikungunya

( ) Dengue

( ) Eye infection

( ) Gastrointestinal infection (not listed here)

( ) Giardia

( ) Leishmaniasis

( ) Malaria

( ) Positive PPD (skin test for tuberculosis), latent tuberculosis

( ) Schistosomiasis

( ) Skin infections

( ) Sexually transmitted disease

( ) Active Tuberculosis

( ) Other (specify)_____

Metabolic or hormonal problems (select any that apply): None ( )

( ) Diabetes

( ) Hyperlipidemia (high cholesterol)

( ) Hyperthyroidism

( ) Hypothyroidism

( ) Other (specify)_____

Musculoskeletal problems (select any that apply): None ( )

( ) Fracture (specify bone)_____

( ) Joint injury specify: __knee __ankle __shoulder __hip __back __other (specify_____)

( ) Tendon rupture

Neurologic (brain, sensory, or nerve) problems *select any that apply): None ( )

( ) Cluster headache

( ) Dementia

( ) Hearing loss

( ) Insomnia

( ) Migraines

( ) Neuropathy

( ) Seizures

( ) Tension headache

( ) Tinnitus

( ) Vestibular disorder (vertigo)

( ) Other (specify)

Eye problems (select any that apply): None ( )

( ) Cataracts

( ) Corneal ulcer

( ) Glaucoma

( ) Keratitis

( ) Retinopathy

Lung problems (select any that apply): None ( )

( ) Asthma

( ) Chronic obstructive lung disease

( ) Other (specify)_____

Psychiatric problems: None ( )

( ) Adjustment disorder

( ) Anxiety disorder

( ) Bipolar disorder

( ) Depression

( ) Panic Disorder

( ) Schizophrenia

( ) Other (specify)_____

10. Prior to Peace Corps, were you ever diagnosed by a health care provider with the following: (checkboxes)

Skin problems (select any that apply): None ( )

( ) Acne

( ) Allergic dermatitis (allergic rash)

( ) Contact dermatitis (rash from contact with something)

( ) Skin cancer

( ) Psoriasis

( ) Other (specify)_____

Heart or circulation problems (select any that apply): None ( )

( ) Arrhythmia (irregular heartbeat)

( ) Cardiomyopathy

( ) Congestive heart failure

( ) Hypertension (high blood pressure)

( ) Myocardial infarction (heart attack)

( ) Other (specify) _____

Gastrointestinal or stomach problems (select any that apply): None ( )

( ) Amoebas

( ) Crohn's disease

( ) Cirrhosis

( ) Duodenal ulcers

( ) Esophageal ulcers

( ) Fatty liver

( ) Gastroesophageal reflux (GERD) or heartburn

( ) Giardia

( ) Inflammatory bowel disease

( ) Irritable bowel syndrome (IBS)

( ) Liver failure

( ) Peptic Ulcers

( ) Other (specify)_____

Genital, reproductive, or urinary tract problems (select any that apply): None ( )

( ) Miscarriages

( ) Recurrent urinary tract infections

( ) Recurrent vaginal yeast infections

( ) Other (specify)_____

Immunologic, rheumatologic, or oncologic (cancer) problems such as (select any that apply): None ( )

( ) Breast cancer

( ) Gastric cancer

( )Leukemia

( ) Liver cancer

( ) Lymphoma

( ) Prostate cancer

( ) Rheumatoid arthritis

( ) Other (specify)_____

Infectious diseases (select any that apply): None ( )

( ) Amoebas

( ) Antibiotic resistant infections

( ) Dengue

( ) Gastrointestinal infection (not listed here)

( ) Giardia

( ) Malaria

( ) Skin infections

( ) Tuberculosis

( ) Other (specify)_____

Metabolic or hormonal problems (select any that apply): None ( )

( ) Diabetes

( ) Hyperlipidemia (high cholesterol)

( ) Hyperthyroidism

( ) Hypothyroidism

( ) Other (specify)_____

Musculoskeletal problems (select any that apply): None ( )

( ) Fracture (specify bone)_____

( ) Tendon rupture

Neurologic (brain, sensory, or nerve) problems *select any that apply): None ( )

( ) Cluster headache

( ) Dementia

( ) Hearing loss

( ) Insomnia

( ) Migraines

( ) Neuropathy

( ) Seizures

( ) Tension headache

( ) Tinnitus

( ) Vestibular disorder (vertigo)

( ) Other (specify)

Eye problems (select any that apply): None ( )

( ) Cataracts

( ) Corneal ulcer

( ) Glaucoma

( ) Keratitis

( ) Retinopathy

Lung problems (select any that apply): None ( )

( ) Asthma

( ) Chronic obstructive lung disease

( ) Other (specify)_____

Psychiatric problems: None ( )

( ) Anxiety disorder

( ) Bipolar disorder

( ) Depression

( ) Schizophrenia

( ) Other
(specify)_____

11. While in Peace Corps, were you prescribed a medication to prevent malaria? (Y/N)
    a. If yes, antimalarial prescribed [atovaquone/proguanil (malarone), chloroquine, doxycycline, mefloquine (Lariam), other]
        i. What statement best describes how you took the medication while in Peace Corps:
            1. I took the medication as prescribed.
            2. I took the medication as prescribed most of the time.
            3. I took the medication about half of the time.
            4. I rarely took the medication (less than half of the time).
            5. I never took the medication.
        ii. Approximate length of time actually taking the medication: ## months
        iii. Last time malaria prophylaxis taken during Peace Corps (if you completed a trip directly after COS in an area which required malaria prophylaxis, last time it was taken) MM/YYYY
    b. Were you prescribed any other medication for malaria prophylaxis? (Y/N)
        i. If no, continue to Q12
        ii. If yes, why was a different medication prescribed?
            1. Side effects from original antimalarial
            2. Deployment to a different area requiring a different antimalarial
        iii. Antimalarial prescribed [atovaquone/proguanil (malarone), chloroquine, doxycycline, mefloquine (Lariam)]
            1. Approximate length of time on new antimalarial ____ months
        iv. What statement best describes how you took the medication while in Peace Corps:
            1. I took the medication as prescribed.
            2. I took the medication as prescribed most of the time.
            3. I took the medication about half of the time.
            4. I rarely took the medication (less than half of the time).
            5. I never took the medication.
        v. Approximate length of time actually taking the medication: ## months

vi. Last time malaria prophylaxis taken during Peace Corps MM/YYYY
vii. Have you taken malaria prophylaxis since leaving Peace Corps? Y/N
    1. If yes, approximate number of courses since PC ____

The next few questions will help us understand your current state of health

12. Since leaving Peace Corps have you ever been diagnosed by a health care provider with the following:

Skin problems (select any that apply): None ( )

( ) Acne

( ) Allergic dermatitis (allergic rash)

( ) Contact dermatitis (rash from contact with something)

( ) Skin cancer

( ) Psoriasis

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Accutane

( ) Adalimumab

( ) Amnesteem

( ) Anthralin

( ) Avage

( ) Calcipotriene

( ) Calcitrene

( ) Claravis

( ) Dovonex

( ) Doxycycline

( ) Fabior

( ) Hydrocortisone cream

( ) Humira

( ) Isotretinoin

( ) Methotrexate

( ) Rheumatrex

( ) Sorilux

( ) Sotret

( ) Tazarotene

( ) Tazorac

( ) Tetracycline

( ) Trexall

( ) Zithranol

( ) Other(specify) _____

Heart or circulation problems (select any that apply): None ( )

( ) Arrhythmia (irregular heartbeat)

( ) Cardiomyopathy

( ) Congestive heart failure

( ) High cholesterol

( ) Hypertension (high blood pressure)

( ) Myocardial infarction (heart attack)

( ) Other (specify) _____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Accupril

( ) Acebutolol

( ) Aceon

( ) Adalat

( ) Altace

( ) Altocor

( ) Altoprev

( ) Amlodipine

( ) Atacand

( ) Atenolol

( ) Atorvastatin

( ) Atromid

( ) Avalide

( ) Avapro

( ) Benazepril

( ) Benicar

( ) Betaxolol

( ) Bisoprolol

( ) Blocadren

( ) Brevibloc

( ) Cardene

( ) Cardizem

( ) Calan

( ) Candesartan

( ) Capoten

( ) Captopril

( ) Carteolol

( ) Cartrol

( ) Colestid

( ) Corgard

( ) Coumadin

( ) Covera

( ) Cozaar

( ) Crestor

( ) Diltiazem

( ) Diovan

( ) Dynacirc

( ) Enalapril

( ) Eprosartan

( ) Esmolol

( ) Felodipine

( ) Fluvastatin

( ) Fosinopril

( ) Furosemide

( ) Hydrochlorothiazide

( ) Hyzaar

( ) Inderal

( ) Irbesartan

( ) Irbesartan and hydrochlorothiazide

( ) Isoptin

( ) Isradipine

( ) Kerlone

( ) Lasix

( ) Lescol

( ) Levatol

( ) Lipex

( ) Lipitor

( ) Lipostat

( ) Lisinopril

( ) Lopid

( ) Lopressor

( ) Losartan

( ) Losartan and hydrochlorothiazide

( ) Lotensin

( ) Lotrel

( ) Lovastatin

( ) Mavik

( ) Metoprolol

( ) Mevacor

( ) Micardis

( ) Monopril

( ) Moexipril

( ) Nadolol

( ) Niacin

( ) Niaspan

( ) Nicardipine

( ) Nicolar

( ) Nifedipine

( ) Nimodipine

( ) Nimotop

( ) Nisoldipine

( ) Norvasc

( ) Olmesartan

( ) Pravastatin

( ) Pravachol

( ) Penbutolol

( ) Preindopril

( ) Pindolol

( ) Plendil

( ) Prinivil

( ) Procardia

( ) Propranolol

( ) Questran

( ) Quinapril

( ) Ramipril

( ) Rosuvastatin

( ) Sectral

( ) Selektine

( ) Simvastatin

( ) Sular

( ) Telmisartan

( ) Teveten

( ) Timolol

( ) Toprol

( ) Tenormin

( ) Trandolapril

( ) Tricor

( ) Univasc

( ) Valsartan

( ) Vasotec

( ) Verapamil

( ) Verelan

( ) Visken

( ) Warfarin

( ) WelChol

( ) Zebeta

( ) Zestril

( ) Ziac

( ) Zocor

( ) Other(specify) _____

Gastrointestinal or stomach problems (select any that apply): None ( )

( ) Amoebas

( ) Crohn's disease

( ) Cirrhosis

( ) Duodenal ulcers

( ) Esophageal ulcers

( ) Fatty liver

( ) Gastroesophageal reflux (GERD) or heartburn

( ) Giardia

( ) Inflammatory bowel disease

( ) Irritable bowel syndrome (IBS)

( ) Liver failure

( ) Peptic Ulcers

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Adalimumab

( ) Apriso

( ) Asacol

( ) Azathioprine

( ) Azulfidine

( ) Balsalazide

( ) Certolizumab

( ) Cimetidine

( ) Cimzia

( ) Ciprofloxacin (Cipro)

( ) Colazal

( ) Colace

( ) Cortisone acetate

( ) Cyclosporine

( ) Delzicol

( ) Dexamethasone

( ) Dipentum

( ) Dulcolax

( ) Esomeprazole

( ) Famotidine

( ) Flagyl

( ) Giazo

( ) Humira

( ) Hydrocortisone

( ) Infliximab

( ) Lialda

( ) Lansoprazole

( ) Maalox

( ) Mercaptopurine

( ) Mesalamine

( ) Methotrexate

( ) Methylprednisolone

( ) Metronidazole

( ) Mylanta

( ) Natalizumab

( ) Nexium

( ) Olsalazine

( ) Pantoprazole

( ) Pegol

( ) Pepcid

( ) Prednisolone

( ) Prednisone

( ) Prevacid

( ) Protonix

( ) Prilosec

( ) Ranitidine

( ) Remicade

( ) Sulfasalazine

( ) Tagamet

( ) Tysabri

( ) Tums

( ) Zantac

( ) Other (specify) _____

Genital, reproductive, or urinary tract problems (select any that apply): None ( )

( ) Miscarriages

( ) Recurrent urinary tract infections

( ) Recurrent vaginal yeast infections

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Amoxicillin-clavulanate

( ) Augmentin

( ) Bactrim

( ) Ciprofloxacin (Cipro)

( ) Diflucan

( ) Fluconazole

( ) Furadantin

( ) Gyne-Lotrimin

( ) Levaquin

( ) Levofloxacin

( ) Macrodantin

( ) Monistat

( ) Nitrofurantoin

( ) Septra

( ) Sulfamethoxazole-trimethoprim

( ) Other (specify)_____

Immunologic, rheumatologic, or oncologic (cancer) problems such as (select any that apply): None ( )

( ) Breast cancer

( ) Gastric cancer

( )Leukemia

( ) Liver cancer

( ) Lymphoma

( ) Prostate cancer

( ) Rheumatoid arthritis

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Abatacept
( ) Actemra
( ) Adalimumab
( ) Advil
( ) Aleve
( ) Anakinra
( ) Arava
( ) Azathioprine
( ) Azasan
( ) Azulfidine
( ) Certolizumab
( ) Chemotherapy for cancer
( ) Cimzia
( ) Cortisone acetate
( ) Cyclosporine
( ) Dexamethasone
( ) Enbrel
( ) Etanercept
( ) Gengraf
( ) Golimumab
( ) Humira
( ) Hydrocortisone
( ) Hydroxychloroquine
( ) Ibuprofen
( ) Imuran
( ) Infliximab
( ) Kineret
( ) Leflunomide
( ) Methotrexate
( ) Methylprednisolone
( ) Motrin
( ) Naproxen sodium
( ) Neoral
( ) Orencia
( ) Plaquenil
( ) Prednisolone
( ) Prednisone
( ) Radiation therapy
( ) Remicade
( ) Rituxamab

( ) Rituxan

( ) Sandimmune

( ) Simponi

( ) Sulfasalazine

( ) Tocilizumab

( ) Tofacitinib

( ) Trexall

( ) Xeljanz

( ) Other (specify) _____

Infectious diseases (select any that apply): None ( )

( ) Amoebas

( ) Antibiotic resistant infections

( ) Dengue

( ) Gastrointestinal infection (not listed here)

( ) Giardia

( ) Malaria

( ) Pneumonia

( ) Skin infections

( ) Tuberculosis

( ) Urinary tract infections (kidney, bladder)

( ) Vaginal yeast infections

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Amoxicillin

( ) Amoxicillin-clavulanate

( ) Artemether-lumefantrine

( ) Atovaquone-proguanil

( ) Augmentin

( ) Azithromycin

( ) Bactrim

( ) Carbapenem

( ) Ceclor

( ) Cefaclor

( ) Cefadroxil

( ) Cefipime

( ) Cefixime

( ) Cefpodoxime

( ) Cefprozil

( ) Ceftin

( ) Ceftriaxone

( ) Cefuroxime

( ) Cefzil

( ) Cephalexin

( ) Chloroquine

( ) Cilastin

( ) Ciprofloxacin (Cipro)

( ) Clindamycin

( ) Coartem

( ) Diflucan

( ) Doxycycline

( ) Duricef

( ) Ethambutol

( ) Flagyl

( ) Fluconazole

( ) Furadantin

( ) Gatifloxacin

( ) Gyne-lotrimin

( ) Hydroxychloroquine

( ) Imipenem

( ) Isoniazid

( ) Keflex

( ) Lariam

( ) Levaquin

( ) Levofloxacin

( ) Lorabid

( ) Loracarbef

( ) Macrodantin

( ) Malarone

( ) Mefloquine

( ) Meropenem

( ) Metronidazole

( ) Monostat

( ) Nitrofurantoin

( ) Polymyxin B

( ) Primaquine

( ) Pyrazinamide

( ) Quinine

( ) Rifampin

( ) Septra

( ) Sulfamethoxazole-trimethoprim

( ) Suprax

( ) Tetracycline

( ) Vantin

( ) Zinacef

( ) Zithromax

( ) Other (specify) _____

Metabolic or hormonal problems other than menopause (select any that apply): None ( )

( ) Diabetes

( ) Hyperlipidemia (high cholesterol)

( ) Hyperthyroidism

( ) Hypothyroidism

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Actos

( ) Alogliptin

( ) Altocor

( ) Altoprev

( ) Amaryl

( ) Atorvastatin

( ) Avandia

( ) Baycol

( ) Cerivastatin

( ) Cholestyramine

( ) Cholybar

( ) Crestor

( ) Diabeta

( ) Fenofibrate

( ) Fluvastatin

( ) Gemfibrozil

( ) Glimepiride

( ) Glipizide

( ) Glucophage

( ) Glucotrol

( ) Glyburide

( ) Glynase

( ) Insulin

( ) Januvia

( ) Lescol

( ) Linagliptin

( ) Lipex

( ) Lipitor

( ) Lipobay

( ) Lipostat

( ) Lopid

( ) Lovastatin

( ) Micronase

( ) Metformin

( ) Mevacor

( ) Nateglinide

( ) Nesina

( ) Niacin

( ) Nicotinic acid

( ) Onglyza

( ) Plioglitazone

( ) Prandin

( ) Pravastatin

( ) Pravachol

( ) Questran

( ) Repaglinide

( ) Rezulin

( ) Rosiglitazone

( ) Rosuvastatin

( ) Saxagliptin

( ) Selektine

( ) Simvastatin

( ) Sitagliptin

( ) Starlix

( ) Torvast

( ) Tradjenta

( ) TriCor

( ) Troglitazone

( ) Zocor

( ) Other (specify) _____

Musculoskeletal problems (select any that apply): None ( )

( ) Fracture (specify bone)_____

( ) Osteoporosis

( ) Tendon rupture

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Acetaminophen (Tylenol)
( ) Actonel
( ) Advil
( ) Alendronate
( ) Aleve
( ) Aspirin
( ) Boniva
( ) Evista
( ) Fosomax
( ) Ibandronate
( ) Motrin
( ) Naproxen
( ) Raloxifine
( ) Risendronate
( ) Zolendronic acid
( ) Other (specify) _____

Neurologic (brain, sensory, or nerve) problems *select any that apply): None ( )

( ) Cluster headache
( ) Dementia
( ) Hearing loss
( ) Insomnia
( ) Migraines
( ) Neuropathy
( ) Seizures
( ) Tension headache
( ) Tinnitus
( ) Vestibular disorder (vertigo)
( ) Other (specify)

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Acetaminophen
( ) Aleve
( ) Almotriptan
( ) Amerge
( ) Amoxapine
( ) Amitriptyline
( ) Anafranil
( ) Antivert
( ) Aptiom
( ) Aventyl
( ) Axert
( ) Benadryl
( ) Bonine
( ) Carbamazepine
( ) Carbatrol
( ) Clomipramine
( ) Depakote
( ) Desipramine
( ) Dilantin
( ) Diphen
( ) Dimenhydrinate
( ) Diphenhydramine
( ) Doxepin
( ) Dramamine
( ) Dramamine Less Drowsy Formula
( ) Eletriptan
( ) Epitol
( ) Equetro
( ) Eslicarbazepine acetate
( ) Frovatriptan (Frova)
( ) Gabapentin
( ) Gabitril
( ) Gabrene
( ) Ibuprofen
( ) Imipramine
( ) Imitrex
( ) Maprotiline
( ) Maxalt

( ) Meclizine

( ) Motrin

( ) Naproxen

( ) Naratriptan

( ) Neurontin

( ) Normpramin

( ) Nortriptyline

( ) Oxcarbazepine

( ) Pamelor

( ) Phenytek

( ) Phenytoin

( ) Pregabalin

( ) Progabide

( ) Proptriptyline

( ) Relpax

( ) Rizatriptan

( ) Sabril

( ) Silenor

( ) Sumatriptan

( ) Surmontil

( ) Tegretol or Tegretol-XR

( ) Tiagabine

( ) Tofranil

( ) Trileptal

( ) Trimipramine

( ) Tylenol

( ) Valproic acid (or valproate)

( ) Vertin

( ) Vigabatrin

( ) Vivactil

( ) Zolmitriptan

( ) Zomig

( ) Zonalon

( ) Other (specify)_____

Eye problems (select any that apply):

Do you currently wear glasses? Y/N

Other eye problems: None ( )

( ) Cataracts

( ) Corneal ulcer

( ) Glaucoma

( ) Keratitis

( ) Retinopathy

( ) Other (specify) _____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Betaxolol

( ) Betoptic

( ) Latanoprost

( ) Timolol

( ) Timoptic

( ) Xalatan

( ) Other (specify)_____

Lung problems (select any that apply): None ( )

( ) Asthma

( ) Chronic obstructive pulmonary disease (COPD) or emphysema

( ) Pneumonia

( ) Restrictive lung disease

( ) Other (specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Accolate

( ) Albuterol

( ) Albuterol-ipratropium bromide

( ) Accuneb

( ) Aerobid

( ) Alupent

( ) Asmanex

( ) Azmacort

( ) Beclomethasone

( ) Budesonide

( ) Combivent

( ) Cromolyn sodium

( ) Deltasone

( ) DuoNeb

( ) Flovent

( ) Flunisolide

( ) Fluticasone

( ) Foradil

( ) Formoterol

( ) Intal

( ) Levalbuterol

( ) MAxair

( ) Metaproterenol

( ) Mometasone

( ) Montelukast

( ) Nedocromil sodium

( ) Orapred

( ) Pirbuterol

( ) Prednisone

( ) Prednisolone

( ) Prelone

( ) Proair

( ) Proventil

( ) Pulmicort

( ) Salmeterol

( ) Serevent

( ) Singulair

( ) Symbicort

( ) Tilade

( ) Triamcinolone

( ) Ventolin

( ) Xoponex

( ) Zafirlukast

( ) Zileuton

( ) Zyflo

( ) Other (specify) _____

Psychiatric problems: None ( )

( ) Anxiety disorder

( ) Bipolar disorder

( ) Depression

( ) Obsessive-compulsive disorder

( ) Schizophrenia

( ) Other(specify)_____

For each disease checked:

Year of diagnosis: YYYY

Have you taken medications for the conditions you have listed? No/Yes

If no: next question

If yes: Please select all medication that you have ever taken for the diagnoses listed. Note that both the generic and brand names are given, and only one (either generic or brand name) needs to be selected.

( ) Amitriptyline

( ) Amoxapine

( ) Anafranil

( ) Asendin

( ) Aventyl

( ) Bupropion

( ) Celexa

( ) Citalopram

( ) Clomipramine

( ) Clonazepam

( ) Clozapine

( ) Clozaril

( ) Cymbalta

( ) Desipramine

( ) Desvenlafaxine

( ) Diazepam

( ) Doxepin

( ) Droleptan

( ) Droperidol

( ) Duloxetine

( ) Escitalopram

( ) Eldepryl

( ) Emsam

( ) Effexor

( ) Fluoxetine

( ) Fluvoxamine

( ) Geodon

( ) Haloperidol

( ) Imipramine

( ) Inapsine

( ) Isocarboxazid

( ) Lexapro

( ) Lullan

( ) Luvox

( ) Maprotiline

( ) Marplan

( ) Midazolam

( ) Mirtazapine

( ) Nardil

( ) Nefazodone

( ) Normpramin

( ) Nortriptyline

( ) Olanzapine

( ) Oleptro

( ) Orap

( ) Pamelor

( ) Parnate

( ) Paroxetine

( ) Paxil

( ) Perospirone

( ) Pexeva

( ) Phenelzine

( ) Phenobarbital

( ) Pimozide

( ) Pristiq

( ) Proptriptyline

( ) Prozac

( ) Quetiapine

( ) Remeron

( ) Risperdal

( ) Risperidone

( ) Saphris

( ) Sarafem

( ) Selegiline

( ) Serenace

( ) Seroquel

( ) Sertraline

( ) Silenor

( ) Surmontil

( ) Tofranil

( ) Tranylcypromine

( ) Trazodone

( ) Trimipramine

( ) Venlafaxine

( ) Vivactil

( ) Wellbutrin

( ) Zelapar

( ) Zeldox

( ) Ziprasidone

( ) Zoloft

( ) Zonalon

( ) Zyprexa

( ) Other (specify) _____

Lastly, these questions will help us understand if you might be in a group at higher risk for certain diseases.

13. Have you ever smoked cigarettes? (Y/N)

    a. If yes, do you currently smoke cigarettes? (Y/N)
        i. If yes, how much? (##)packs per day for (##) years
        ii. If no, how much did you used to smoke? (##) packs per day for (##) years

14. Do you drink alcohol? (Y/N)

    b. If yes, how many drinks per week? (##)

15. How many days per week do you exercise vigorously for at least 30 minutes ? (0-7)

16. Highest level of education achieved (High school, some college, associate's degree, bachelor's degree, graduate degree, professional degree)

17. Occupational status:

    c. Fulltime b. Part-time c. Unemployed, not on disability d. On disability e. retired f. other (specify)

18. Marital status: a) married, or long-term partnership b) divorced c) single, not previously divorced

19. Age (##)

20. Sex (M/F)

21. Ethnicity (Hispanic or Latino, Not Hispanic or Latino)

22. Race (American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, Black or African-American, Asian, White, Other)

Appendix B: Consent Form (to be shown online prior to entering the survey) Flesch-Kincaid level 6.6

Introduction and purpose

The Centers for Disease Control and Prevention (CDC) and Peace Corps are conducting a survey to learn about long-term health outcomes among Peace Corps Volunteers (PCVs). This survey will help us understand what diseases for which PCVs might be at risk. To do this, we are conducting anonymous surveys among PCVs who served between 1995–2014. We would like to invite you to take part in this survey.

Procedures

Taking this survey is up to you. Participating will not cost you anything. If you agree, we will ask you some questions about your health since leaving Peace Corps. You can choose not to answer any questions that you wish for any reasons. The survey will take 20 minutes to complete. Once completed, the survey results will be sent to CDC.

Confidentiality

Survey results will be compiled and analyzed as a group. Although aggregate results will be shared with Peace Corps, no information that can identify you individually will be collected or shared. Survey data will be kept private to the extent allowed by law.

Risks/benefits

This survey has little risk. The information we collect could benefit PCVs by improving the knowledge of PCMOs on the health risks of PCVs.

Cost

The only cost to you for being in the survey is your time. You will not be paid to take part in this survey.

Right to refuse or withdraw

It is up to you to join the assessment or to withdraw at any time. You can choose to skip any questions you do not want to answer. While taking the survey, if you decide that you do not want to take part, you can simply stop answering questions.

Persons to contact

If, at any time, you have questions or problems related to this assessment, you may contact Kathrine Tan (404) 718-4701, e-mail: ktan@cdc.gov

I have read the above information and:

___ I consent to participate (when clicked, the program will continue to the survey)

___ I do NOT consent to participate (when clicked, the screen will read "Thank you for your time." and will NOT continue to the survey)

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