



Young Epidemiology Scholars
Competition

2010-11 YES Competition
YES Research Project Guidelines

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The YES Competition at a Glance

About the YES Competition

Did you ever wonder if your social relationships affect your use of alcohol or cigarettes, or how your high school would handle the outbreak of a contagious disease?

The YES Competition is a fun and challenging nationwide scholarship competition. Students submit original research projects using the methods that epidemiologists utilize to discover ways to improve the health of the public. Epidemiology is the scientific method used to investigate, analyze and prevent or control a health problem in a population.

WHO? High school juniors and seniors are eligible to enter

WHAT? Win one of 120 college scholarships from \$1,000 to \$50,000

HOW? Pose a question about a health problem that concerns a group or groups of people

Choose a problem where a health condition or health risk factor is the outcome

Gather or find data using the methods that epidemiologists employ

Present the results and suggest ways to improve the problem

Research papers should be no more than 30 pages

WHEN? Enter by February 1, 2011, 9 a.m. Eastern Time

Explaining Epidemiology

Epidemiologists find the causes of health problems, identify which groups of people are most affected, and determine the best options for preventing a risky exposure or controlling and treating disease. Epidemiological methods are used in a wide variety of public health fields to help understand why a health problem occurs, how to prevent it, and how to keep it from spreading. Stories that involve the work of epidemiologists appear frequently in the news:

- Outbreaks of illness from contaminated food
- Obesity in children- who's at risk?
- Links between hand washing and flu prevention
- Injuries from texting while driving

Requirements for Participating in the Competition

You can participate if you are a citizen or permanent resident of the United States and if you are a high school junior or senior currently attending school in the United States, Puerto Rico, Guam, U.S. Virgin Islands, American Samoa, or the Mariana Islands.

The Kinds of Health Problems You Can Research

You can investigate health issues that matter to you, your family, friends, peers, community or people in the world around you. Your research must be designed to answer a question that has a health condition or health risk factor as the outcome or dependent variable of interest. For example, you might be interested in researching the effects of sleep deprivation in high school students. Possible associated health outcomes might include frequency of injuries, contagious illnesses, substance abuse, or changes in weight.

In contrast, the effects of sleep deprivation on outcomes such as academic performance or reported ability to concentrate would not be eligible.

After identifying a topic you'll need to gather your own data, or you can use data collected by others. The next step is to perform an in-depth analysis of your research, make conclusions based on the results, and suggest ways in which the health of the population you studied could be improved based upon your findings.

Here's what previous YES Scholars say about choosing their topics

"My summer internship motivated my desire to learn more about the importance of mammography screening. I learned that although early detection is known to save lives, many women still do not receive routine mammography screening. Research is an important way of finding out why the situation exists."

Sydney Beach
Louisville Collegiate School
Louisville, Kentucky
2008-09 National Finalist

"I was concerned about the impact that obesity has on children and teens, making them more vulnerable to conditions like high blood pressure and type-2 diabetes, and thus causing them to have greater absenteeism from school due to health issues. I decided to focus on the association between sleep and obesity. Sleep insomnias, in particular, were significantly associated with increased BMI (Body Mass Index) values, especially among girls aged 9-12. This association remained strong after considering the subjects' socioeconomic status, age and ethnicity, as well as symptoms of major depressive disorder."

Gabrielle Milner
Bronx High School of Science
Bronx, New York
2008-09 Regional Finalist

"My experiences as a peer drug educator inspired me to continue exploring the myths and realities surrounding adolescent alcohol use in particular. I began to pursue this area of research so that I could explore the relationship between parents and their children and the role that the relationship plays in predicting teen drinking. I found that in the group of teens I surveyed, they were more likely to accept underage drinking or be underage drinkers themselves if they think that their own parents drank as teens. My data indicated that the same was true if their parents permitted them to drink and did not closely monitor their activities outside the home."

Chelsea Jurman
Roslyn High School
Roslyn Heights, New York
2008-09 National Third-Place Winner

See more YES Scholars' comments on the "Winners" pages under the YES Student Competition tab of this website.

Mentors as Resources

A mentor is not required but can be a valuable resource. A mentor can help you formulate an idea and can act as a consultant; however, you must complete the actual work on the project. You can ask your teacher, parent, or a person with experience in your area of research, to be your mentor.

Entering Your Project

Entering is very easy. All you need to do is complete an online registration form and upload your project online. That's all it takes!

The deadline to register and upload your project is **February 1, 2011 at 9 a.m. Eastern Time.**

Scholarship Awards Available

Each year up to 120 students receive college scholarships ranging from \$1,000 to \$50,000.

- Up to 60 Semifinalists receive scholarship awards of \$1,000.
- Up to 60 Regional Finalists receive an expense-paid trip to present their research at the regional and national competitions in Washington, D.C.
- 48 Regional Finalists receive scholarship awards of \$2,000.
- 12 Regional Finalists compete in the national finals for awards ranging from \$15,000 to \$50,000:
 - Six receive \$15,000 each
 - Two receive \$20,000 each
 - Two receive \$35,000 each
 - Two receive \$50,000 each

In addition to meeting other students with your same interests and having an exciting experience, Regional Finalists are able to meet and talk with some of the nation's most distinguished epidemiologists, public health professionals, and teachers.

Before registering, please read the 2010-11 Competition Information and Research Project Guidelines. For questions, contact us by email at yes@collegeboard.org or by phone at 877-358-6777.

2010-11 Competition Information

The deadline to register and upload your project is February 1, 2011, 9 a.m. Eastern Time.

YES National Event, Washington D.C., April 15-18, 2011

The future health of the American population depends, in large part, upon the knowledge and ability of our upcoming health leaders, practitioners, and researchers. The Young Epidemiology Scholars (YES) Competition for original student research is designed to inspire talented students to investigate the many behavioral, biological, environmental, and social factors that affect health and, based upon this knowledge, to identify ways to improve the health of the public. The YES Competition awards up to 120 college scholarships each year to high school juniors and seniors who conduct outstanding research projects that apply epidemiological methods of analysis to a health-related issue.

Epidemiologists seek answers to why some people get sick and others don't. In other words, epidemiology is the science of exploring patterns of disease, illness, and injury within populations with the goal of developing methods for prevention, control, and treatment to improve health.

The basic skills required by epidemiology—framing the right question, collecting relevant information, and analyzing it to answer the question—are skills that help students succeed in any area of future work. The study and application of epidemiology promotes a way of thinking that can be used effectively in both scientific and nonscientific settings. As a science, epidemiology helps explain the world in which we live and has strong links to personal decisions that each of us make every day. As a way of thinking, epidemiology can help explain significant historical events and inform current decision-making in a broad variety of sectors. Leaders of communities, states, and countries often rely on epidemiological analysis of data when they make critical policy decisions that may affect the well-being of their residents.

Eligibility

The 2010-11 YES Competition for students is open only to juniors and seniors who will graduate from high school no later than September 1, 2012. You must be a citizen or permanent resident (holding a green card) of the United States and enrolled in and attending a high school located in the United States, Puerto Rico, Guam, U.S. Virgin Islands, American Samoa, or the Mariana Islands. Home-Schooled students who reside in the countries listed above are also eligible. U.S. citizens who are attending American

and International schools abroad, or participating in a study abroad program during 2010-11, are not eligible. Only one project per student is accepted. **Team projects are not eligible.**

If you were previously selected as a YES National Finalist and awarded a YES scholarship of \$15,000 or more, you are not eligible to compete for a second year. Otherwise, if you meet all other eligibility criteria, you may reapply to the competition by submitting a Research Report consisting of new and original research. You may not submit the same topic as you did in a previous year unless you have significantly advanced your research (e.g., adding substantive new data, analysis, or other material).

Participating as a Regional Finalist

Regional Finalists are required to attend the YES National Event, which takes place in Washington, D.C., on April, 15-18, 2011. The YES National Event is intended to provide you with the opportunity to present your research, and to compete with other students across the nation. The primary purpose of the program's mission is the opportunity for you to meet, present in front of, and interact with like-minded peers and accomplished public health professionals. An important goal is for you to learn about epidemiology and public health through a variety of activities. A sample event agenda is below.

In support of the program's mission, Regional Finalists are expected to take part in all activities throughout the weekend. Additionally, each student must be accompanied by a parent, guardian, or chaperone. Due to the very tight scheduling requirements of this competition, adjustments to the activity schedule are extremely difficult and special accommodations cannot be guaranteed. If, as a Regional Finalist, you are unable to participate in all scheduled activities, your award status will be that of Semifinalist, and you will receive a \$1,000 scholarship award. Therefore, before submitting a Research Report, you are strongly encouraged to determine your availability to ensure that conflicting personal obligations do not prevent you from participating in all activities throughout the entire event.

Sample Event Agenda

Friday

- 9 a.m. - 3:30 p.m. Arrival and hotel check-in
- 12 noon - 4:30 p.m. Registration
- 5 - 6:55 p.m. Student welcome dinner
- 7:15 - 7:30 p.m. Student orientation
- 7:30 - 9:30 p.m. Student social

Saturday

- 9 a.m. - 3 p.m. Regional Finalist presentations (60 competitors)
- 3 - 3:30 p.m. Student portraits
- 4 - 7 p.m. Student activity and outside group photo
- 7 - 9:30 p.m. Student dinner

Sunday

- 9 a.m. - 4:15 p.m. National Finalist presentations (12 competitors)
- 4:15 - 7 p.m. Television interviews for the 12 National Finalists
- 7 - 9:30 p.m. Recognition dinner
- 9:30 - 10 p.m. Photographs

Monday

- 8:30 - 10 a.m. Awards ceremony
- 10 - 11 a.m. Brunch
- 11 a.m. - 12 noon National Event concludes

To enter the competition, you must register online and upload a written Research Report of your research project by February 1, 2011, 9 a.m. Eastern Time. **Reports sent via email, fax or mail are not accepted.**

Mentors & Advisors

A mentor or advisor is not required for the YES Competition, but can be extremely helpful in the development of your project. A mentor or advisor may help you formulate an idea and act as a consultant and offer advice, but the actual work on the project—the study design and analysis of the data—must be carried out independently by the student competitor. A mentor or advisor should have a clear understanding of the YES Competition project guidelines. Your mentor can help you:

- Evaluate your study design before you begin your research
- Help you understand the application of epidemiological methods you employ in your research
- Aid you in figuring out how to obtain data and conduct statistical analysis and help edit your report
- Provide relevant feedback as you progress
- Assist you in thinking through future applications and directions for further research

You must be able to demonstrate how you have advanced the project independently, and Research Reports must clearly describe the extent of any involvement by mentors or advisors. What you produce must be your own question, thinking, analysis and writing. In a nutshell, you must have complete ownership of your Research Report.

Judging & Awards

Each year, up to 120 students share as much as \$456,000 in college scholarships. Scholarships can be used for tuition, fees and on-campus room and board at accredited colleges or universities in the United States.

YES Competition judges select students to receive scholarship awards based on the quality of their research.

- Up to 60 Semifinalists receive scholarship awards of \$1,000, completing their participation in the competition.
- Up to 60 Regional Finalists (up to 10 from each of six regions of the country defined by the College Board) receive an expense-paid trip to Washington, D.C., to compete in the regional and national finals on April, 15-18, 2011. Regional Finalists are judged on the basis of their written research reports, oral presentations and oral question and answer sessions.
- 48 Regional Finalists receive scholarship awards of \$2,000.
- 12 National Finalists compete in front of a panel of national judges. National Finalists receive awards ranging from \$15,000 to 50,000:
 - Six receive \$15,000 each
 - Two receive \$20,000 each
 - Two receive \$35,000 each
 - Two receive \$50,000 each

Award Notification

- March 30, 2011: Semifinalists and Regional Finalists announced on the YES website
- April, 15-18, 2011: YES regional and national competitions in Washington D.C.

Instructions to Enter the 2010-11 YES Competition

The deadline to register and upload your project is February 1, 2011 at 9 a.m. Eastern Time.

There are three easy steps to the YES application process:

1. Create a collegeboard.com user name and password. This is the same user name and password you use for other College Board services, such as registering for the SAT®. If you already have an account, click on the Apply Online link and log in. If you do not have an account, you are prompted to create one.

2. Complete the online registration form. After entering your user name and password, you are linked to the YES Competition Registration Form. You may complete and submit the form in one sitting, or you may save it and return to it later. You can access your saved registration form by going to Apply Online and entering your log-in information.

Before you submit your registration, make sure the information is accurate. You are not able to make changes once you submit and will need to contact YES Competition staff to make any changes (see contact information below). After you submit your registration, you are directed to the **Upload Research Project** page where you'll see your confirmation number. This number must be placed on the first (Abstract) page of your Research Report in the upper right corner

3. Answer questions about your research and upload your report. After submitting your registration, you are directed to a page to answer questions about your report. Once the questions are completed, you are directed to a page to upload your report. Your report must be in a **Microsoft Word document** in order to upload successfully. If you convert your report from another word processing program to Microsoft Word, please make sure the file converts correctly and text, graphs and tables are properly formatted. Do not include or embed Microsoft Power Point slides or video in your report. We recommend using Internet Explorer as your web browser when completing your registration and uploading your project. Using browsers other than Internet Explorer may result in errors when saving your information.

After your project uploads successfully, you receive a confirmation page to print and keep for your records. You may upload your report multiple times before the deadline. The last version uploaded is the only one saved; therefore, it is your final submission.

You are not officially entered in the YES Competition until you upload your Research Report! The deadline to register and upload your report is February 1, 2011, 9 a.m. Eastern Time.

If you have difficulties uploading your report, need to make corrections to registration information, or require other technical assistance, please contact the YES program staff. Staff members are available Monday through Friday from 8:30 a.m. - 5 p.m. Eastern Time at 877-358-6777, or by email at yes@collegeboard.org.

2010-11 Research Project Guidelines

The deadline to register and upload your project is February 1, 2011 at 9 a.m. Eastern Time.

YES National Event, Washington D.C., April, 15-18, 2011

Please make sure you read all sections of the Research Project Guidelines before submitting your project.

About Your Research Project

YES research projects should address a health problem in a human population using the methods that are employed by epidemiologists. To accomplish that, your YES research project should:

1. Clearly state a question or hypothesis about a health problem concerning a clearly defined group of people.
2. Make certain that the question has a health condition or a health risk factor as the outcome variable.
3. Select an appropriate study design.
4. Obtain and analyze data related to your question or hypothesis.
5. Present results that either answer your original question or contribute to what is known in that area.
6. Suggest potential ways to improve people's health based on the results of your examination of the data.

These guidelines can help you better understand the types of problems examined by epidemiologists, the methods they use to tackle these problems, and how you can make use of those methods in your project.

The Kinds of Health Problems You Can Look At

While medical doctors are primarily concerned about the health of individual people, epidemiologists are primarily concerned with the health status of **groups of people** or the public at large.

For example, if you go to your family doctor with a case of food poisoning, your doctor's first priority is to take immediate steps to diagnose the illness, decide on a treatment for you, and assist in your recovery. However, an epidemiologist would be interested in a number of other things, including:

- What food made you ill—and might also be a risk for other people?
- How and where did you get the food—can you figure out who else might have eaten the contaminated food?
- Are there specific groups of people (such as children, the elderly, or those with weakened immune systems) who would be most severely affected by a food-borne illness—and should be targeted for identification and treatment?
- How should people who might have been exposed be notified—and treated, if necessary?
- How did the food become contaminated in the first place—and how could this be controlled for this outbreak and prevented in the future?

When many people hear the term "epidemic," they immediately think of the rapid spread of infectious diseases such as swine flu – H1N1 or human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS). Epidemiologists are very much involved with tracking, controlling, and preventing such diseases, but they also are concerned with non-infectious illness and health problems, such as:

- Chronic, non-infectious diseases, such as cancer, asthma, and diabetes
- Disability due to illness or injury
- Causes of premature death, such as automobile accidents or youth violence
- Factors that put people at higher risk for developing health problems (for example, smoking, exposure to toxic waste, or obesity)
- Factors that make some people healthier than others, keep them from becoming ill, or help them live longer or with greater vitality than others (for example, physical activity or healthy nutrition)

Tip: If you have questions or concerns about the appropriateness of your research topic, talk with your mentor or high school teacher. You may also email the YES program at yes@collegeboard.org and we'll be happy to provide you with feedback.

Once You've Identified a Problem

Now you need to figure out the question that you want to find the answer to, and design a study that can answer that question. Though not required, a mentor or advisor can be very helpful to you as you select your study design and plan how to obtain the information—the data—that you analyze to answer your question. There are different types of study designs, these include:

1. Descriptive Study

Your first step might be to accurately describe the problem. A descriptive study answers types of questions like who, what, when, where, and how big. An example would be describing the frequency (prevalence) of a specific health problem in a particular group of people, or in one group compared to another. You might choose to determine the rate of cigarette smoking in the population of high school students at your school, and compare the rates between boys and girls. A descriptive study might measure the magnitude of a health problem in a particular group of people, or describe how it differs among people of different age, gender, ethnicity, geographical location, or other factors. In other words, the study describes the patterns of health and disease in people. A descriptive study can be used to identify key areas to investigate as possible causes of illness, injury, or death. **It is important for you to**

understand that a descriptive study is not simply a narrative essay or historical research paper, but must include data about one or more population groups.

2. Analytic Studies

An analytic study investigates the relationships between potential causal factors and health outcomes. Factors (also called independent variables) may be exposures (sunlight, smoky rooms), behaviors (exercise, eating habits), or characteristics (family history of asthma, immigrant status). A factor may be associated with an increase in the frequency of a health condition outcome (making it a possible risk factor for that health outcome) or with a decrease in the frequency of the health outcome (making it a possible protective factor). For example, descriptive studies have found that African American babies are twice as likely to die within the first year of life as white American babies. Knowing this information from a descriptive study, and then using knowledge about possible causal factors that have different likelihoods in the two populations, a researcher could test hypotheses about possible factors that could lead to this difference in death rate. As you think about possible causal factors, think about whether there is a possible mechanism that might explain how the factor could influence whether or not a health problem would occur, or in what form that problem would occur, or at what point in time. Also consider if there are other risk factors that might also contribute to the observed pattern that you might want to check into at the same time as you look at the factor you suspect is the most important determinant.

You may use observational or experimental analytic studies to explore relationships between factors and an outcome.

Observational studies

"Observational" means that the investigator uses or collects data based upon observing actions or exposures of the people in the study without manipulating their environment in any way.

- One type of observational study is a **cross-sectional study**. In this study, the information on the exposure or risk factor is collected at the same time as information about the health outcome. Observational studies are often performed by using a survey. For example, high school athletes might answer questions on risk factors such as helmet use, training, and type of sport they play, as well as questions on the outcome, such as what types of injuries and the severity of the injuries they have experienced playing different sports.
- Another type of observational analytic study is a **cohort** study. In this type of study, a group of people—a cohort—is selected and data on baseline characteristics is collected. Later, during a second data collection time, information on whether or not the individuals in the cohort experienced the health outcome of interest is gathered. For example, high school athletes might answer questions on a survey of risk factors at the beginning of a season and then at the end of the season answer questions on a survey of one or more health outcomes, such as whether or not they experienced a head injury during the season.
- A third type of observational study is a **case-control** study. In these studies, people who have already experienced the health outcome—the cases—are identified. A similar group of people who did not experience the health outcome—the controls—are also identified. Then information on risk factors or exposures that the study participants experienced over a period of time prior to the health outcome is collected. The histories of the cases and controls are then compared to see if they differ by suspected risk factors or other exposures. For example, high school athletes who visited an emergency room or doctor's office due to head injury could form the case group, while high school athletes who did not seek health care during the same time period could form the control group.

Once you have collected your data, how do you determine whether or not there is a relationship between a potential factor and the health outcome of interest?

- You want to know if the frequency or severity of a particular health outcome was different in a group that had the possible causal factor versus a group that did not have that factor.
- You also want to know the direction of that relationship. Does the factor increase or decrease the likelihood of the health outcome?
- Finally, you want to know the strength of the relationship between the factor and the health outcome. Is the relationship greater than what would be expected if the information you collected was determined by chance? In other words, is it statistically significant?

The type of statistical test that you should perform on your data depends upon the question you are asking, the study design, and the kinds of data you collected. It is important to understand the basis for a statistical test to decide if it is the appropriate one to use for your study. It is very helpful to graph your basic data first, inspect the patterns you see, and start with simple statistical tests rather than moving immediately to multivariate tests. The actual calculations performed for the statistical analyses can be performed using statistical software programs such as Excel, Access, STATA, Epi Info, SPSS, and SAS.

Experimental exposures and interventions

Another way to investigate a possible cause, preventive, or therapeutic methods for a health problem is to test interventions to see if they affect the frequency of a health outcome. Testing for the effects of an intervention is similar to the classic scientific experiment in which there is a baseline state, exposure to an intervention, and then an end state, or outcome. In the case of a controlled experiment, the researchers control the conditions to which subjects are exposed. Then they compare the health status of people who received the exposure or intervention to those who did not. For example, you might post nutritional information on school lunches during one lunch period but not during another lunch period, and determine whether students receiving nutritional information made healthier food choices. You also might study how the effect of the exposure is modified by other factors.

Other times epidemiologists study the effects of natural experiments. In these situations, the researcher does not control who receives the exposure. An example might be that one state passes laws to prevent smoking in public places, but a neighboring and similar state does not. Epidemiologists can compare the rate of smoking-related diseases in the two states over a subsequent time period. In natural experiments, the researcher cannot control the assignment of the exposure or intervention to the subjects or exposure to other factors that may also influence the health outcome.

Data Collection

The data you collect and analyze for your YES research project may be obtained from both primary and secondary data sources. Your decision to use primary or secondary data depends upon your research questions and what you can realistically accomplish. No preference is given to projects using one type of data over another.

In your project you must:

- Clearly describe how your data was obtained
- Explain how your analysis of the data contributes to the answer of your research question or how it supports or refutes your hypothesis
- Explain how your findings compare with those of other studies, analyses, policies, or regulations.

Primary data means information collected directly by the researcher (i.e., you) by interacting with the people being studied (your study subjects). This information can be obtained through interviews, questionnaires, measurements (like weight), or by direct observation. Primary data comes straight from the source; in the case of surveys, that means straight from the participants' replies. If you choose to collect primary data, it is important that you discuss human subject protection guidelines with your mentor or school officials, because there are certain confidentiality and safety requirements that must be followed by all researchers (see below).

Secondary data is information collected by researchers and made available for use by other researchers, such as you. Many governmental agencies, academic researchers, and other organizations offer secondary data that you can analyze free of charge. Many of these same organizations also provide online interactive query functions to facilitate analysis by other researchers. Examples of secondary data include data sets available through the Centers for Disease Control and Prevention (CDC), Data2010, and the National Center for Health Statistics (NCHS). See the epidemiological resources page for descriptions and links to many secondary data sets that are available for your use. Many state and local public health agencies and departments of health collect health-related data and make them available to researchers and community members. If you are interested in learning more about these sources, we recommend that you contact your state or local department of health, in particular the public health surveillance office or the state epidemiologist. You also could contact one of the Prevention Research Centers in your region.

Research Involving Human Subjects

If your research project plan involves you administering questionnaires, interviews, examinations, or surveys of people, it is important that you protect the identity and personal data of the participants in your study. In your Research Report, you must

explain how you received permission to access this personal data. Also identify who approved the use of the data in your project, for example a school administrator, human rights committee member, or other official.

When researchers use human subjects in their study that poses potential risks to subjects, they must receive approval from an Institutional Review Board (IRB). An IRB is a committee that protects the rights and welfare of human subjects, assists the researcher on ethical and procedural issues related to the use of human subjects in research, and facilitates compliance with federal regulations. Although the YES Competition does not require that you obtain IRB approval, your school or mentor's institution may require formal approval through an IRB or other process. We encourage you to work with your high school teachers and administrators, or with your mentor, to review the process and check on requirements before you begin your research. You can find links to additional information about IRB guidelines and processes on the Epidemiology Resources page under:

- United States Department of Health and Human Services
- National Institute of Health
- Bucknell University

If your research project utilizes publicly available secondary data sources, then you do not need to get IRB or other formal approval.

Academic Integrity

Academic integrity is a fundamental value of the YES Competition and scientific research. Your Research Report and presentation slides must be your original work; coauthored reports are not eligible. If you use ideas, techniques, facts, words, images, or information from other sources (including the Internet) you must ensure that these sources are properly cited. It is not sufficient to simply modify the words of an original source and claim it as your own. If you have used the essential idea, you must cite the source.

Violations of academic integrity will result in disqualification.

The YES Competition uses specific procedures as part of the judging process to detect plagiarized materials. If your Research Report is found to have improper citations or if citations are omitted, intentionally or unintentionally, you will be disqualified from the YES Competition.

Dos & Don'ts

In completing your YES research project there are several Dos and Don'ts:

Advice to Follow

Do address a question where a health outcome or a health risk factor is the endpoint. For example, you might be researching the effects of smoking. An example of an eligible question would be the effect of smoking on asthma attacks in a college-aged population. Conversely, asking what the effect of smoking is on educational achievement in a college aged-population would not be eligible, as educational achievement is not a health outcome.

Do pick a project that does one or all of the following: describes patterns of a health problem, investigates possible causes of health outcomes, or assesses the effects of an exposure or intervention on a health outcome.

Do make your research original. You must formulate and design the research project. You must either collect the data yourself or obtain data from a secondary source. You must perform and thoroughly understand the analysis, and you must be able present and discuss your results and their implications.

Do clearly describe how your data was obtained. You may use primary data (directly collected by you, the researcher) or secondary data (collected by someone else but available to you, the researcher).

Do describe the permission process you used to access personal data about your population. Refer to the Research Involving Human Subjects for details.

Do explain how your analysis of the data contributes to the answer for your research question or how it supports or refutes your hypothesis.

Do describe how your findings compare with those of other studies, analyses, policies, or regulations.

Do tell us what additional research in this area would be helpful and feasible, and if your research points to possible interventions to improve a population's health.

Do properly cite all references and sources.

Do carefully edit your paper. Spelling errors and poor grammar may lower the judges' scores.

Things to Avoid

Don't submit a literature review of previous research projects or a historical or narrative essay. Your research must include a question or hypothesis about a health problem, analyze data, and present results.

Don't submit purely laboratory-based (bench) research. However, you might combine laboratory-based research with health data obtained from groups of people in a way that addresses your research question.

Don't tailor your research to the health of only one or a small number of individuals. Epidemiological research typically deals with groups of people or populations. The size of the population may range from the student body of a school, to the residents of a small town or region, to the nation. There must be sufficient numbers involved, or proof that the sample is representative of a larger population, so that you can reach meaningful conclusions.

Don't focus on characteristics of the health care delivery system. This area of research is called health services research, and it does share and borrow epidemiological methods. However, the YES Competition emphasizes other determinants that interact to shape the health of populations—not the medical care system.

Don't attempt to create a new health care technology. An exception to this general rule would be a project designed to test the effectiveness of a new technology for prevention, screening, or treatment.

Don't rely only upon open-ended interviewing and focus groups (qualitative research) without quantitative analysis. Although qualitative research is an important technique, it is not the emphasis of the YES Competition. However, projects that take information learned from qualitative methods and combine it with quantitative epidemiology would be eligible.

Don't conduct animal research. The rare exception might be a project that combines data from animal research with human health data to understand factors relating to who is susceptible to a disease or how a disease spreads.

Don't use another person's words or ideas as if they were your own. It is critical that you properly cite all references. Projects where references are not properly cited will be disqualified.

Content & Organization of Your Research Report

To ensure fairness, Research Reports are initially evaluated without reference to any personal information about the student.

Absolutely no personal identifying information is to appear anywhere in the body of your report or in your abstract.

Personal identifying information includes but is not limited to:

- Student or participant names
- References to gender, race or ethnicity
- Names of high schools or school officials

- Names of mentors or advisors
- Names of affiliated research organizations
- References to geographic location that is not critical to your research

This information can only be noted on the Project Description Page of your online registration form. After you submit your registration, you'll automatically be directed to the Project Description Page where you can list the name of your mentor or advisor as well as anyone else who made a contribution to your project. In the body of your report you may use a general expression to distinguish your references. For example, if you are citing the work you performed in a specific research institution, you could use the term "research facility." If you wish to cite an individual such as your advisor, you may substitute the word "advisor." **Submissions that do not adhere to these and other guidelines will be disqualified.**

Your YES Research Report should be organized as follows

- Abstract
- Introduction
- Methods
- Results
- Discussion
- List of references

1. Abstract (1 page maximum)

The abstract must be the first page of your submission. Begin by restating your project title at the top of the abstract and place your confirmation number in the upper right corner. The abstract should be no more than one page. It should succinctly state the purpose of the study or investigation, the basic methods (procedures for collection or selection of data and analytical methods), results (specific findings of importance) and the principal conclusions. The abstract should emphasize what is new or important about your study.

Tip: Write your abstract after you write your full Research Report. This way, the elements you include in your abstract are organized and easy to summarize.

2. Research Report

Your Research Report should be divided into sections with these headings: Introduction, Methods, Results, and Discussion. Subheadings may be used within the latter three sections if they clarify the content.

Introduction: the "why" section (1-2 pages recommended)

Your Introduction should state the purpose and rationale for your project. In it, you should state your research question succinctly, but thoroughly. The introduction should state why it is important to address this question, describe the population to be studied, and identify how your research result could make a difference.

Methods: the "how" section (2-8 pages recommended)

The Methods section lets you explain to other researchers how you conducted your study. It should be detailed enough to allow another researcher to replicate your procedures. In this section you should:

- Explain your study design
- Outline your procedures for data collection and include how and why you chose your data source. Explain all processes used for selecting and processing data, including those used for obtaining permission to use personal data (if applicable).
- Identify the age, gender, and other characteristics that made up inclusion criteria for the study population and explain why, if applicable.

- Explain the sampling technique, that is, how the participants in the study were chosen.
- Describe what material you obtained from subjects and how you obtained it, if applicable.
- If there was an exposure or intervention (e.g., exposure to a possible toxin or protective factor; a natural experiment due to a change in policy or regulation; or a preventative or therapeutic maneuver, such as a behavioral change program) describe the essential features, including duration and intensity.
- Define the primary outcome measure for the study. Generally, you should determine how you to measure the outcome before you begin collecting data. Tell us if the defined outcome measure changed during the research period and, if so, why. For example, the outcome measure for a project investigating the effectiveness of a community intervention to reduce obesity might be a 50% increase in average physical activity level. How would this be defined and measured?
- Explain the analytical methods used. Describe your statistical methods with enough detail so that a knowledgeable person with access to your original information can verify the results you report. Be sure to give standard references for statistical methods. Tell us why the analyses you carried out were appropriate for your study design.

Results: what did you find? (2-8 pages recommended)

The Results section is where you present the answer to the question posed by your project.

- Present your results in a logical sequence in the text, tables, and illustrations.
- Try not to repeat information in your text that is shown in your tables and figures; instead summarize the findings from each table and figure. Do not include tables listing each participant and their data points – that is your database, not your results!
- Describe the key quantitative findings, as well as the statistical tests assessing significance. For example, if your project explores the possibility of a causal relationship between use of cellular telephones and rates of brain cancer, you should report the rates of brain cancer in cell phone users and nonusers in addition to presenting the results of the statistical test (the "p" value) for the difference in rates, as only reporting the p value would not sufficiently convey your findings.

Tip: You don't need to give a laundry list of every analysis you performed or could have performed. Your readers are more impressed if you can pick out and present the most salient results.

Discussion: what do your results mean? (8-16 pages recommended)

In the Discussion section, describe how your results fit or do not fit with previous research studies.

- Emphasize the new and important aspects of your project, and the conclusions that justifiably can be drawn from the findings.
- Describe the meaning and implications of your results. Provide sufficient detail to support your interpretation.
- Discuss the strengths and limitations of the study.
- Link your conclusions to the objectives of your project; avoid unqualified statements that are not completely supported by the data.
- Explain how your conclusions could lead to follow-up research.
- Outline any unanswered questions related to the project and explain how those could be addressed in a subsequent study.
- Discuss ways in which you might improve upon or modify the study to move the results forward.

3. References

Every citation in your text must have a corresponding reference listed in alphabetical order at the end of your Research Report. Research Reports found to have improper or omitted citations, whether intentional or unintentional, will be disqualified. Review the Academic Integrity section of the research project guidelines.

- Follow American Psychological Association (APA) editorial style for citations and references.
- When using APA format, follow the author-date method of in-text citation. This means that the author's last name and the year of publication for the source should appear in the text, e.g., (Jones, 1998), and a complete reference should be listed at end of your paper. For more information, refer to the APA Publication Manual (5th ed., 2001).

Formatting Requirements

You must follow all formatting requirements to ensure that your entry qualifies for the YES Competition. These formatting requirements apply to all sections of the project. Research Reports must adhere to the following specifications:

- Uploaded as a **Microsoft Word** document.
- Confirmation number placed on the first (Abstract) page of your research report.
- Maximum of 18 MB and 30 pages, including abstract, figures, graphics, tables, appendices, and references. There is no required word count.
- 1-inch margins on all sides
- Double-spaced text
- Formatted to print on single-sided 8 ½ x 11 inch paper
- 12-point type, Arial font for all pages including, abstract and references
- Place captions below pictures and graphs. Do not place personal identifying information on figures or graphs. Use 10-point type, Arial font and single spacing for captions.
- Number all pages in the lower right-hand corner, beginning with the first (Abstract) page.

Evaluation Criteria

These are the questions the YES judges consider when reviewing submissions.

Overall Criteria

- Do the question, methods, results, and interpretation demonstrate originality and creativity?
- Does the student demonstrate critical thinking?
- Does the student communicate clearly?

Introduction

- Does the project address an important or interesting real-world problem that has a health outcome?
- Does the student explain or justify the important or interesting aspects of the project?
- Does the student state the research question succinctly, clearly, and competently?

Methods

- Did the student select an appropriate design for the study's central question or hypothesis?
- Did the student generate or find appropriate data sources for the study's central question or hypothesis?
- Does the student's selection of analytical methods demonstrate an understanding of concepts of epidemiology?

Results

- Has the student applied the analytical methods correctly (e.g., comparisons of groups, use of statistical tests)?
- Does the student clearly state the results of the investigation? For example, does the student illustrate the results effectively with tables, graphs, or figures?
- Do the results pertain to the research question asked?

Discussion

- Does the student adequately explain or defend the choice of design, data sources, and analytic methods? (e.g., did student realize there were alternative ways to approach the question, but this is what was feasible or realistic or available?)
- Does the student describe how the results of the study answer the research question, as well as how and why the findings contribute to the understanding of a health issue?
- Does the student present a pathway for future research or interventions? Does the student present a rationale for any suggested follow-up studies?

Frequently Asked Questions

YES requires the analysis of data. What is the difference between primary and secondary data?

Primary data is data that you collect yourself—for example, a survey that you administer that asks about the health behaviors of people in your community. Secondary data is data that has already been collected by someone else, and you analyze it in a new way to answer the question that you are interested in. For example, data collected by the Centers for Disease Control and Prevention (CDC) on disease rates in different states could be used as secondary data.

How do I decide which type of data, primary or secondary, I should use for my YES research?

You must determine which type of data would be best for answering your question of interest. For example, if you have a question about why disease rates are different around the United States, this is probably not data you would be able to collect yourself. If you are interested in a certain health problem in your own school or community, this is likely data that is not already available. As a general rule, you should investigate whether there is data that has already been collected that could answer your question and use this if it is available. If it is not, determine how realistic it would be to collect your own data.

Can I collect my own data by conducting studies on animals?

No. There are important ethical issues involved in animal experimentation. Only formally trained scientists, who have their studies reviewed by other scientists for benefit to scientific knowledge and humane treatment of animals, can engage in these studies. In addition, the YES Competition requires your research project to focus on health and disease in people, not in animals.

Since I may use secondary data on animals, would a research paper exploring the diseases prevalent in animals or insects qualify?

No. The focus of the YES Competition is on disease in humans. However, it would be appropriate to examine the prevalence of diseases in animals or insects if your research aim is to examine the relationship between disease rates in animals or insects with human disease rates, or address how disease rates in animals or insects affect disease rates in humans.

Can I submit a project in which I have conducted genetic research?

In most cases, no. One exception is if frequencies of genes or levels of gene expression are examined with respect to health outcomes in human populations. This is known as genetic epidemiology and is considered appropriate for the Competition. A second exception is if behaviors or exposures of established importance for human health are examined with respect to gene expression, as

a method of understanding biological pathways to specific disease outcomes. In this case, the established importance of both the exposure and genes of interest to a disease outcome must be made clear in order for the project to be eligible.

Can I create a mathematical model as my YES research project?

Yes. Mathematical models are appropriate as long as they are focused on understanding the distribution and causes of disease or the optimal application of interventions in human populations.

Can I conduct an environmental study for my YES project?

Yes. You may conduct an environmental study if the environmental exposure is tied to human health and a health outcome is included in your analysis. For example, a study of whether exposure to a certain toxin is associated with rates of disease in humans would be eligible.

The research project guidelines state "Don't submit purely laboratory-based (bench) research." Can you explain the difference between this type of research and epidemiological research?

Research scientists focus on clinical lab work and the biology of diseases; epidemiologists focus on public health and the pattern of diseases. Epidemiologists study the reasons why large populations of people get sick in order to find the cause of the illness and develop plans for controlling the spread of disease. For example, epidemiologists investigating the H1N1 Flu (Swine Flu) outbreak collect and analyze data about the infected population, to look for patterns and try to determine causal associations. With this information, epidemiologists can then make predictions about where the disease first occurred, how it is being transmitted, and who is most likely to be infected. Then they can develop strategies to prevent the disease from spreading. A research scientist would study how the flu affects the human body and conduct lab experiments to develop a drug treatment plan, which could reduce or eliminate the flu's effects, or develop a vaccine to prevent healthy individuals from getting sick.

I began work on my research project last year as a school assignment. Am I allowed to enter this project in the YES Competition?

Yes. Your research does not have to begin the same year you enter. As long as your project follows the guidelines outlined in the Research Project Guidelines, it does not have to be created solely for the purpose of submitting it for the YES Competition.

I have decided to ask a mentor to help me with my project. What assistance can a mentor provide?

Though not required for the YES Competition, a mentor or advisor could be helpful in the development of your project. A mentor may help you formulate an idea and act as a consultant and offer advice, but you must determine the study design and analyze the data. A mentor can help you evaluate your study design before you begin your research, give relevant feedback as you progress, and help you understand the application of epidemiological methods that you use in your research.

I entered the YES Competition as a junior, am I allowed to enter it again as a senior?

You are not eligible to compete for a second year if you were previously selected as a YES national finalist and awarded a scholarship of \$15,000 or more. Otherwise, if you meet all eligibility requirements, you may reapply by submitting a Research Report of new and original research. You may not submit the same topic as the previous year unless you have significantly advanced your research (e.g. adding substantive new data or other material).

I am a sophomore but am taking advanced classes, am I eligible for the Competition?

No. The YES Competition is open to high school juniors and seniors only. You must be enrolled and attending high school during the year in which you compete. You are not eligible if you are in a lower grade and are taking advanced classes, or if you have already graduated from high school.

I am a senior in high school and graduate in January, before the Competition deadline. I am not planning on attending the graduation ceremony until May and am taking college classes until that time. Am I eligible to participate?

Because you will have officially graduated from high school you are not eligible to participate. You must be currently enrolled in high school and attending classes as a junior or senior at the time of the Competition deadline.

Can I submit a registration and then submit my project later, or do I have to submit both at the same time?

Either way is acceptable. Once online registration opens for the Competition year, you may submit your registration and choose to wait to upload your project at a later date. Or, you may wait until your project is complete, then register and upload the project at the same time. You must submit a registration and upload your project by the deadline of February 1, 2011, 9 a.m. Eastern Time.

Where do I find the confirmation number in order to enter it on the first (Abstract) page of my project?

You receive a confirmation number after you finalize and submit your online registration form. Once you click **final submit** and your registration data is received, you get a confirmation number at the top of the next page. See the sample page below. You continue to see your confirmation number each time you log in. After you upload your Research Report, your registration information—including your confirmation number—is displayed. You should print this page for your records.



I want to reference certain individuals or institutions in my Research Report. How can I do this without mentioning a name?

To reduce bias and protect confidentiality, Research Reports are read by a panel of expert judges without reference to identifying personal information. You may not refer to names of students, high schools, advisors, or mentors anywhere in your report or abstract. This information can only be noted on the Project Description Page of your online registration form. After you submit your registration, you'll automatically be directed to the Project Description Page where you can list the name of your mentor or advisor as well as anyone else who made a contribution to your project. You may use a general expression to distinguish your references. For example, if you are citing the work you performed in a specific research institution, you could use "research facility." If you wish to cite an individual such as your advisor you may substitute the word "advisor."

Are graphs and charts included in the 30-page limit?

Yes. Research Reports are limited to a maximum of 30 pages, including abstract, figures, tables, graphs, appendices, and references. Read about other requirements in the Content and Organization section of the website.

My project topic seems similar to one submitted by a previous YES Scholar. May I request a copy of their project to review?

Projects remain the property of the student author. The YES Competition cannot give you copies of projects, nor can we provide contact information for that student. To get an idea of a winning project, you can view abstracts of the national winners on the YES website. Place your cursor on the **YES student competition** tab and click on the menu links for lists of previous winners.

If I am selected as a Regional Finalist, on what date do I have to travel to Washington, D.C.?

Up to 60 Regional Finalists are selected to travel to Washington D.C. to participate in the regional and national competitions on April, 15-18, 2011. You must be available to participate in all activities during this four-day event, which begins Friday and concludes at noon on Monday. Additionally, each student must be accompanied by a parent, guardian, or chaperone. Due to the very tight scheduling requirements of this competition, adjustments to the activity schedule are extremely difficult and special accommodations cannot be guaranteed. If, as a Regional Finalist, you are unable to participate in all scheduled activities, your award status will be that of Semifinalist, and you will receive a \$1,000 scholarship award. Therefore, before submitting a Research Report, you are strongly encouraged to determine your availability to ensure that conflicting personal obligations do not prevent you from participating in all activities throughout the entire event.

May I submit my YES project to another competition or for publication?

Yes. Projects, Research Reports, and findings remain your property to utilize as you wish.

Do I have to major in epidemiology to receive my scholarship?

You are not required to choose a specific area of study or major in order to receive your YES scholarship. Scholarships awards are applicable for tuition, required fees, and on-campus room and board at an accredited college or university located in the United States.

How do I receive my scholarship award?

Each year in June, the YES Program sends you an instruction letter, disbursement guidelines, and a disbursement request form identifying your current award balance. You are responsible for telling us how much of your award you want to use and for sending the form to the financial aid office at your college. Once your institution verifies that you are eligible for the amount you requested, the YES Program sends a check directly to the college. We send those checks beginning in August.