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Secondary Data Analysis as an Efficient and Effective Approach to Nursing Research

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Abstract

Meeting the expectation for scholarly productivity can be challenging for nursing faculty, especially in the absence of grant or other funding. Secondary data analysis is one strategy to address this challenge. The use of existing data to test new hypotheses or answer new research questions has several advantages. It typically takes less time and resources, is low risk to participants, and allows access to large data sets and longitudinal data. Despite these advantages, limitations do exist, including a lack of knowledge of the existence of rich data sets and how to obtain and evaluate the contents, insufficient or outdated data, and lack of funds to hire staff to assist with the work. Exemplars of secondary data analysis using public government and private data sets are presented along with the skills needed to conduct this type of analysis. Secondary data analysis is an efficient and effective approach to conducting nursing research.

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Nursing faculty within colleges and universities are expected to demonstrate excellence in teaching, scholarship, and service. Meeting the expectation for scholarly productivity can be particularly challenging. Scholarship is most often equated with a program of research, including grant submissions and published manuscripts. Yet, in the absence of funding through grants or other sources or even with funding, the ability to develop rich data sets, especially longitudinal data sets, can be challenging. One strategy to address this challenge is to conduct secondary analysis of existing data sets. This article presents an overview of secondary data analysis, its benefits and limitations, sources of data commonly used to conduct secondary analytic procedures, and important skills needed in working with secondary data sets. In addition, secondary data analysis exemplars conducted without funding support (in progress and completed) by nurse scientists are presented.

An Overview of Secondary Data Analysis in Nursing

Secondary data analysis is the use of existing data to test new hypotheses or answer new research questions (Doolan & Froelicher, 2009; Polit & Beck, 2012). It is a well-established methodology in a number of disciplines. The use of secondary data by nurse scientists has been increasing in recent years, although it remains an underutilized approach in nursing research (Aponte, 2010). A PUBMED literature search of secondary data analysis articles published from 1997 to 2003 identified only 82 nursing studies conducted using secondary data analysis (Smaldone & Connor, 2003). A similar and more recent PUBMED search from 2003 to 2008 showed a slight increase with 99 nursing studies identified using secondary data analysis (Aponte, 2010). Although this represents a 21% increase, the use of secondary analysis remains relatively small in nursing due to a variety of factors including a lack of knowledge relative to the availability of secondary data and how to access it (Aponte, 2010). Some nurse scientists may not be skilled in secondary data analysis techniques (Aponte, 2010; Garmon Bibb, 2007) and may also not be aware of continuing education resources available to them at professional meetings, in professional journals, or through mentoring by an experienced secondary data analysis researcher. Other factors may include limited attention given to secondary data analysis in nursing textbooks and journals (Doolan & Froelicher, 2009), and an emphasis within some PhD programs to

collect primary data to obtain direct experience with all aspects of the research process including obtaining informed consent, recruiting participants, and performing data collection.

Benefits of Secondary Data Analysis

Data collection is often the most time-consuming and expensive aspect of primary research. Analysis of existing data can answer important research questions, while often being completed in much less time. Secondary data analysis typically requires less time and monetary resources to conduct as data sets are often obtained at minimal or no cost, data are readily available and therefore take less research staff time, and there is no need to provide incentives to study participants. Secondary data research is also by nature of low risk to participants (Doolan & Froelicher, 2009), provided the data are de-identified. It offers a prudent approach to research in that primary researchers typically collect more data than they initially analyze. Secondary data sets often contain large sample sizes and longitudinal data, typically increasing the generalizability of findings. A strength of secondary analysis is that variables, relationships among variables, and subgroups within a sample not previously analyzed can be examined and may result in important new findings that contribute to existing programs of research and advance the science. The use of secondary data provided by nurse or health care scientist colleagues fosters inter and intraprofessional collegiality within and outside the discipline of nursing. Secondary data analysis may be the best option for some research because, even with significant funding, rich data sets may not be able to be collected by a single researcher or research team, especially if it is longitudinal data.

Limitations of Secondary Data Analysis

Despite the advantages of secondary analyses, limitations do exist. To complete secondary data analysis, nurse scientists must have the ability and resources to identify, locate, and access appropriate or desired databases (Aponte, 2010; Garmon Bibb, 2007). Once data are accessed, investigators must have the skills to evaluate the quality of the data and whether or not the available data can appropriately address the research questions of interest (Aponte, 2010; Doolan & Froelicher, 2009; Garmon Bibb, 2007). Data sets may be incomplete or insufficient due to missing data and variables not properly measured, or because of the sample characteristics or size. Because most secondary data sets are descriptive in nature, it is not always possible to examine causality. Secondary data may be outdated because of a lag time

between data collection and the proposed secondary data analysis (Aponte, 2010). Last, secondary data analysis can be limited by a lack of funds to hire staff to assist with the research project (e.g., literature review, data retrieval, data entry) or a statistician to assist with data analysis.

Sources of Secondary Data

Public Government Data Sets

Secondary data are available through a variety of sources. Public federal or state health care data sets are a common source. These data sets represent national or state populations and typically have large sample sizes, tend to oversample minority groups, and include subjects from varied geographical areas (Aponte, 2010). For these reasons, these data sets tend to be generalizable. Many public government data sets are now available online or by CD-ROM and can be accessed through a formal data inquiry system (Aponte, 2010; Doolan & Froelicher, 2009).

Large data sets containing health statistics are available from surveys sponsored from a variety of government agencies. One such agency is the Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS), which is a principal health statistics agency for the United States. The mission of NCHS is to provide statistical data that will guide actions and policies to improve the health of the nation (CDC, 2014). The NCHS sponsors a number of surveys, including the National Health and Nutrition Examination Survey (NHANES), National Health Care Surveys, National Health Interview Survey (NHIS), National Immunization Survey (NIS), and Longitudinal Studies of Aging (LSOA). The Agency for Healthcare Research and Quality (AHRQ) is another federal agency that sponsors the collection of large, longitudinal hospital care data sets. The mission of AHRQ is to produce evidence to increase health care safety and quality and to make to it more accessible, equitable, and affordable (AHRQ, 2014). AHRQ data sources include the Medical Expenditure Panel Survey (MEPS), Healthcare Cost and Utilization Project, National Healthcare Disparities Report, National Healthcare Quality Report, and State Inpatient Databases (SID). Other government agencies with available data for secondary analysis include the U.S. Census Bureau and the Centers for Medicare and Medicaid.

Private Data Sets

Data sets are also available through private organizations, including voluntary, professional, and health care agencies. The American Heart Association

(AHA; 2014), as the nation's oldest and largest volunteer health organization, makes a variety of data sets available to health care professionals. For example, the AHA (2010) Get With the Guidelines quality improvement program provides data sets focused on hospitals' adherence to secondary prevention guidelines. Data sets are available within other private organizations, such as Press Ganey, a private company that focuses on best practices for organizations and improving patient experiences. Press Ganey (2014) recently acquired the National Database of Nursing Quality Indicators (NDNQI), which collects data on nursing structure, process, and outcome indicators. Hospitals, health insurance companies, and pharmaceutical companies can also be a source of secondary data (Doolan & Froelicher, 2009). Data made available from nurse scientist colleagues, from other health care professionals, and from one's own previously collected data are other common sources of data for secondary analysis.

Evaluating and Using Data Sets

Although the same research principles used in primary research also apply to secondary data analysis, conducting a secondary analysis requires important knowledge and skills. The nurse scientist must have a good understanding of the existence of rich data sets and how to locate, obtain, and evaluate the data (Aponte, 2010; Garmon Bibb, 2007). To conduct a thorough and accurate secondary analysis, all components of the data set must be considered to optimize reliability, validity, and generalizability. It is essential that the selected data set be in close alignment with the theoretical framework used to guide the secondary analysis (Magee, Lee, Giuliano, & Munro, 2006) and be appropriate to address the research questions being posed. In selecting the data set with the best fit, nurse scientists must complete a careful review of the raw data, data codebooks, and research procedure manuals, if available (Aponte, 2010). This allows investigators to better understand the design and methodology of the original study, especially how the data were collected, the inclusion and exclusion criteria, the available variables and their measurement, and the sample size. Quality of the data should be assessed by evaluating the research questions for both the primary research and secondary data analysis planned, the data coding and entry processes, the presence of missing data, and how missing data values were handled (e.g., imputation, deletion). At this point, research questions may need to be refined based on the characteristics of the data set (Doolan & Froelicher, 2009). If research questions are modified, the revised research questions must remain relevant to the data set and the state of the science.

Secondary analysis may include the examination of an entire existing data set, a subset of study participants within the data set who share characteristics of interest, or may include an examination of two or more merged data sets. Sorting and merging of data need to be performed accurately and appropriately. To facilitate the analysis of large and complex data sets, nurse scientists must select appropriate statistical software (Aponte, 2010), giving careful attention to analytical guidelines provided by the data set manual or person/agency providing the data.

Exemplars of Secondary Data Analysis Research

AHA Go Red Heart Match Data

Arslanian-Engoren, Eastwood, DeJong, and Berra (2014) recently completed a secondary analysis of the AHA Go Red Heart Match data. These data were originally collected in 2012 as part of an online program to provide women with heart disease and caregivers of individuals with heart disease the opportunity to connect and develop relationships with each other to fight heart disease. De-identified data were requested and obtained electronically from AHA at no cost. Funding was neither sought nor obtained to conduct the secondary data analysis.

The purpose of the secondary analysis was to examine whether participation in the Go Red Heart Match program helped participants engage in heart-healthy behaviors. A total of 117 women completed the online survey and provided the data for this secondary analysis. Results indicated that approximately half of the participants reported they were eating a more heart-healthy diet, exercising more frequently, and losing weight as a result of participating in the Go Red Heart Match program. One in 10 participants indicated that they quit smoking as a result of program participation.

Although the study results are noteworthy and represent a creative way to support heart-healthy behaviors in women, conducting a secondary data analysis without funding support can be challenging. For example, lack of funding support meant monies were not available to pay a statistician to conduct the data analysis or to pay a research assistant to help perform a literature review. Other limitations of conducting the secondary analysis were that content descriptions of response categories labeled *other* were not provided, which limited the ability to discern the contribution or relative importance of this response. Concepts such as “heart-healthy diet” and “exercised more frequently” were not defined in the questionnaire and other factors (e.g., nurse or physician counseling) that may have contributed to heart-healthy behaviors were not described. Last, the questionnaire

combined two different heart-healthy activities (e.g., checking blood pressure and asking family history) into a single item, which made it impossible to separate and analyze the two activities separately.

Despite these limitations, there were several strengths to conducting the secondary analysis. It offered insights into important aspects of participating in heart-healthy behaviors that might otherwise go unexplored because financial constraints would have prohibited data collection. It also provided an avenue for nurse scientists whose scholarship focused on promoting heart-healthy behaviors among women to collaborate and to publish together. By doing so, the secondary data analysis contributed to the advancement of nursing knowledge and provided a foundation from which to base future interventions designed to promote low-cost, heart-healthy behaviors among women and/or caregivers of individuals with heart disease.

National Heart, Lung, and Blood Institute's (NHLBI) Biologic Specimen and Data Repositories Information Coordinating Center (BioLINCC) Data

Scott and Engoren (2015) obtained an existing data set from the NHLBI's BioLINCC. This is a repository established to facilitate access to two population-based scientific resources: biologic and epidemiologic/clinical trial data, with the goal of maximizing the scientific value of original investigations previously funded by the NHLBI (https://biolincc.nhlbi.nih.gov/home/). In particular, the data repository includes individual-level data on more than 580,000 participants from more than 110 NHLBI-supported clinical trials and observational studies. One such data set available was an epidemiologic study examining sleep issues.

Sleep problems have become more common among middle-aged and older adults, particularly women. This is concerning given that factors affecting the quantity and quality of sleep have been associated with increased health problems, disorders, and utilization of services (Kapur et al., 2002; Van Dongen, Rogers, & Dinges, 2003). Assessing sleep through subjective and objective measures can increase our understanding of sleep and identify strategies that may maximize health outcomes.

In the original NHLBI study (Wang et al., 2011), patients with a suspected sleep disorder were recruited from a clinic in a larger tertiary medical center. An actigraph, a watch-like device that uses an accelerometer to measure continuous movement, was worn on the non-dominant wrist for a 7-day period. One-week activity data were collected on 420 patients with additional series of measurements obtained on 76 patients 2 months to 1 year later. Although

actigraphy may be useful for evaluating a variety of sleep related disorders where sleep laboratory testing is inappropriate or too expensive, there are few studies showing its diagnostic accuracy. Recognizing this issue, Scott and Engoren (2015) are conducting a secondary analysis of this BioLINCC data set to determine whether applying an innovative approach of time-series analysis of actigraphic data would correctly classify patients' sleep related disorders.

There are a number of advantages to using an existing database for this study. Because objective measures of sleep variables are ideal, the cost associated with their use is high. Although actigraphy is less expensive than other measures such as polysomnography, the equipment is still expensive, especially for use among large samples. Adding to the expense associated with objective sleep measures is the longitudinal nature of the data collection process. By using a database that contains an objective measure of sleep with data collected over time, it increases the ability to explore new study aims in an economical manner.

Given that the aim of this secondary analysis is to use an innovative analytic approach, it will provide insights into both the phenomenon of interest and statistical method. Not only will the results contribute to our understanding of the accuracy and applicability of actigraphy in clinical practice and research, it will also advance knowledge in the use of time-series analyses. In the absence of funding to conduct a prospective study, the research aims would not be accomplished without the accessibility of an existing data set for secondary analysis. It is also fortunate that the investigative team has both the substantive and statistical expertise to achieve the study aims. Without this level of expertise, in addition to a lack of funding to hire a statistician, the innovation associated with this study would have been jeopardized. The secondary data analysis is in process and will serve as the foundation for future research.

Transmission and Acquisition Study (TRAC) Data

Secondary analysis studies have been conducted using data from the TRAC, a large prospective cohort study of patients at Baltimore City sexually transmitted infection (STI) clinics in the 1990s. While engaged in post-doctoral work, Jadack worked with mentors at Johns Hopkins University on the original federally funded TRAC project (Zenilman et al., 1995). At baseline, participants in the study completed an interviewer-administered questionnaire on STI symptoms, sexual history, and risk behaviors; underwent a physical examination; and provided clinical specimens for diagnostic testing and future research.

Jadack, Yuenger, Ghanem, and Zenilman (2006) from Johns Hopkins went on to conduct a secondary analysis years after the initial data collection describing a new biomarker tool to clarify sensitivity issues related to condom use self-report. Using archived vaginal swabs collected from 141 women in TRAC, a polymerase chain reaction (PCR) assay was developed to detect Y-chromosome fragments in vaginal samples. Assay results were compared with self-reported condom use. Results showed that Y-chromosome deoxyribonucleic acid (DNA) was detected in both women who reported using condoms consistently and women who did not use condoms consistently. However, DNA content was significantly lower among the consistent condom users. Findings helped to further understand qualitative, self-report measures of condom use.

Jadack also collaborated with research colleagues to conduct a secondary analysis of male archived serum samples from TRAC (Sutcliffe et al., 2006). The purpose of this study was to examine the extent to which STIs induced inflammatory immune response in the prostate.

Findings from 145 samples showed that patients with STIs were more likely to have 40% or greater prostatic specific antigen (PSA) levels than patients with no STI diagnosis, suggesting that STIs may contribute to prostatic inflammation and cell damage. Both secondary analysis studies carefully assessed the relevancy of the data set being used, assuring that laboratory samples had been skillfully collected and stored, and that survey data included questions appropriate to the proposed secondary analysis research questions.

The original laboratory research in both examples described above was supported by internal and external grants received at Johns Hopkins. However, nurse researchers conducting the secondary data analysis research were not funded. As a non-funded nurse researcher, Jadack completed the statistics for the two secondary data analysis projects described above, working with other multi-disciplinary scholars to reach mutual scholarship goals. In these particular examples, medicine, nursing, and behavioral sciences colleagues worked together to explore questions related to STIs, health, and risk behavior. The TRAC data continue to provide an excellent venue for secondary analysis, sustained connection with research mentors and peers, and scholarly productivity long after the original research and the completion of Jadack's post-doctoral fellowship.

Conducting secondary analyses through interdisciplinary collaborative relationships has the advantage of sustaining productivity in multi-institutional groups that together have more resources to share. In these particular examples, undergraduate students were invited to learn about the research process at the non-funded university through independent study courses and

through small internal student/faculty collaborative grants. Graduate students at the funded university were involved in laboratory work-up of archived samples. These students have helped write and disseminate findings (Pruis & Jadack, 2008; Winn, Stoneberg, & Jadack, 2009).

The TRAC data have provided a foundation for secondary analysis research and scholarship. Collaborative research relationships through secondary analyses have been a fruitful way to initiate and sustain research productivity over time.

Nurse Scientist Data Set

DeKoekkoek, as a senior-level undergraduate nursing student, completed a secondary analysis of a data set provided by a nursing professor at Hope College (Dunn et al., 2014). After completing a literature review focused on the relationship between physical activity and hopelessness, research questions were developed and examined. An existing data set ($n = 520$) was used of which original data were collected from November 2010 to January 2013 as part of a prospective longitudinal study to develop and test a new hopelessness instrument (Dunn et al., 2014). Data were previously de-identified and cleaned, and were made available by the principal investigator to the student and faculty supervising the research project at no cost. After evaluating the data set and its original codebook, DeKoekkoek, with guidance from her faculty mentor, determined whether the data were appropriate to examine the research questions posed in her secondary analysis. Data were analyzed and interpreted under the tutelage of the principal investigator who collected the original data.

As an aspiring nurse scientist with plans to pursue a BSN to PhD nursing program, conducting a secondary data analysis was an efficient and effective approach to complete a research project within a limited time frame. Developing research questions answerable with the existing data served to narrow the scope of the research project, keeping it manageable for an undergraduate educational experience. Although typically used by established nurse scientists, secondary data analysis provided a rich learning opportunity and firsthand experience with nursing research. The scholarly project was completed in one semester, which may not have been possible if data were prospectively collected and without the need to apply for research funding.

Limitations to this secondary data analysis project included that the data were descriptive in nature and causality could not be examined. In addition, there was limited ethnic and racial diversity among the sample making it impossible to include these variables in the secondary analysis.

Overall, this experience with secondary data analysis served as a launch pad for the pursuit of a PhD in nursing. Having conducted secondary data analysis research and presented the findings at local and regional nursing conferences (DeKoekkoek, Vincensi, & Dunn, 2012) helped to boost the student's confidence and desire to pursue higher education to become a nurse scientist. The process of asking questions that are important to patient-centered care, engaging in scientific processes to answer these questions, while generating more questions ignited a passion not only to pursue a program of research but also to learn the competencies needed to mentor others in the art and science of secondary data analysis as part of a future nursing faculty role.

In conclusion, secondary data analysis is an efficient, affordable, and effective approach to conducting nursing research with limited to no funding. Although the conduct of secondary data analysis by nurse scientists has increased in recent years, it is an underutilized method for research productivity. To rectify this, access to and value of existing data sets for secondary analysis must be championed among nurse scientists. In addition, the use of secondary analyses can be further promoted through the dissemination of secondary data analysis findings at professional conferences and in peer-reviewed journals. The availability of secondary analysis nurse research mentors is a vital resource to have in place. As evidenced by the exemplars presented, high-quality secondary data analysis can provide valuable evidence to increase nursing knowledge, guide evidence-based nursing care, and contribute to health care policies.

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References

Agency for Healthcare Research and Quality. (2014). *Mission and budget*. Retrieved from http://www.ahrq.gov/cpi/about/mission/index.html

American Heart Association. (2010). *Get with the guidelines data request*. Retrieved from http://www.heart.org/HEARTORG/HealthcareResearch/FocusonQuality/QualityResearchPublications/Get-With-The-Guidelines-Data-Request_UCM_319145_Article.jsp

American Heart Association. (2014). *About the American Heart Association*. Retrieved from http://www.heart.org/HEARTORG/General/About-American-Heart_UCM_452487_Article.jsp#About

Aponte, J. (2010). Key elements of large survey data sets. *Nursing Economics*, *28*(1), 27-36.

Arslanian-Engoren, C., Eastwood, J.-A., DeJong, M. J., & Berra, K. (2014). Participation in heart-healthy behaviors: A secondary analysis of the American Heart Association Go Red Heart Match Data. *Journal of Cardiovascular Nursing*. Advance online publication. doi:10.1097/JCN.0000000000000190

Centers for Disease Control and Prevention. (2014). *The NCHS mission*. Retrieved from http://www.cdc.gov/nchs/about/mission.htm

DeKoekkoek, T., Vincensi, B., & Dunn, S. (2012, April). *Relationship of activity status prior to experiencing a cardiac event and levels of state and trait hopelessness*. Poster presented at the Midwest Nursing Research Society Conference, Dearborn, MI.

Doolan, D. M., & Froelicher, E. S. (2009). Using an existing data set to answer new research questions: A methodological review. *Research and Theory for Nursing Practice: An International Journal*, *23*, 203-215. doi:10.1891/1541-6577.23.3.20

Dunn, S., Olamijulo, G., Fuglseth, H., Holden, T., Swieringa, L., Sit, M., . . . Tintle, N. (2014). The State-Trait Hopelessness Scale: Development and testing. *Western Journal of Nursing Research*, *36*, 553-571. doi:10.1177/0193945913507634

Garmon Bibb, S. C. (2007). Issues associated with secondary analysis of population health data. *Applied Nursing Research*, *20*, 94-99. doi:10.1016/j.apnr.2006.02.003.

Jadack, R. A., Yuenger, J., Ghanem, K. G., & Zenilman, J. (2006). PCR detection of Y-chromosome sequences in vaginal fluid of women accessing a sexually transmitted disease clinic. *Sexually Transmitted Diseases*, *33*, 22-25.

Kapur, V. K., Redline, S., Nieto, J., Young, T. B., Newman, A. B., & Henderson, J. A. (2002). The relationship between chronically disrupted sleep and healthcare use. *Sleep*, *25*, 289-296.

Magee, T., Lee, S. M., Giuliano, K. K., & Munro, B. (2006). Generating new knowledge from existing data: The use of large data sets for nursing research. *Nursing Research*, *55*(2S), S50-S56. doi:10.1097/00006199-200603001-00009

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Press Ganey. (2014). *NDNQI*. Available from http://www.nursingquality.org/

Pruis, J., & Jadack, R. A. (2008, April). *Social network profiles of clients accessing a rural health department clinic*. Poster presented at the 16th Annual University of Wisconsin–Eau Claire Student Research Day, *Eau Claire*.

Scott, L. D., & Engoren, M. (2015). *Time series analysis: An innovative statistical method to classify sleep disorders*. Manuscript in preparation.

Smaldone, A. M., & Connor, J. A. (2003). The use of large administrative data sets in nursing research. *Applied Nursing Research*, *16*, 205-207. doi:10.1016/s0897-1897(03)00040-5

Sutcliffe, S., Zenilman, J. M., Ghanem, K. G., Jadack, R. A., Sokoll, L. J., Bruzek, D. J., . . . Platz, E. A. (2006). Sexually transmitted infections and prostatic inflammation/cell damage as measured by serum prostate specific antigen concentration. *Journal of Urology*, *175*, 1937-1942.

Van Dongen, H. P. A., Rogers, N. L., & Dinges, D. F. (2003). Sleep debt: Theoretical and empirical issues. *Sleep and Biological Rhythms*, *1*, 4-12.

Wang, J., Xian, H., Licis, A., Deych, E., Ding, J., McLeland, J., . . . Shannon, W. (2011). Measuring the impact of apnea and obesity on circadian activity patterns using functional linear modeling of actigraphy data. *Journal of Circadian Rhythms*, *9*(11), 1-10.

Winn, L., Stoneberg, L., & Jadack, R. (2009, April). *A comparison of social network profiles and violence experiences of women accessing a rural health department clinic*. Presentation given at the 24th Kaleidoscope of Nursing Research, University of Wisconsin–Eau Claire Sigma Theta Tau, *Eau Claire*.

Zenilman, J. M., Weisman, C. S., Rompalo, A. M., Ellish, N., Upchurch, D. M., Hook, E. W., & Celentano, D. (1995). Condom use to prevent incident STDs: The validity of self reported condom use. *Sexually Transmitted Disease*, *22*, 15-21.