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An evaluation of health research methodology in the literature

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Abstract

Understanding the research being conducted in health care is essential to being an effective manager. Using databases such as Medline and Pub Med, provided by the National Institute of Health, and selecting the criteria of keywords "health", "management", "research" and "trial", published since 2002 in English and on human subjects, a population of peer-reviewed journals was identified. A random sample from this population was obtained; the research methodologies were evaluated and compared for practical application.

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AN EVALUATION OF HEALTH RESEARCH METHODOLOGY IN THE LITERATURE

By

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RUNNING HEAD: AN EVALUATION OF HEALTH RESEARCH

An Evaluation of Health Research Methodology in the Literature

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Abstract

Understanding the research being conducted in health care is essential to being an effective manager. Using databases such as Medline and Pub Med, provided by the National Institute of Health, and selecting the criteria of keywords "health", "management", "research" and "trial", published since 2002 in English and on human subjects, a population of peer-reviewed journals was identified. A random sample from this population was obtained; the research methodologies were evaluated and compared for practical application.

Keywords: research methods, healthcare management, literature review

Introduction

How many articles can one read in a day? A week? A month? Every year there are thousands of articles added to the millions already indexed for posterity in the fields of healthcare and health research. An average of 50,000 articles were found added each month to the rolls of Pub Med¹, the searchable database of healthcare research, provided as a service of the U.S. National Library of Medicine and the National Institutes of Health. That becomes over half a million – 600,000 to be exact² – published articles each year. But how does one go about making sense of research in healthcare?

Understanding the current research being conducted in the field is essential to developing a realistic perception of the industry's growth and change. Unfortunately, research can be misleading, as published articles are not always held to desirable standards, even in journals with peer review and lengthy approval processes. Thus, it is necessary to develop the ability to evaluate research reported by colleagues and other professionals, even after their work has been published. Research may need to be retracted at a later date, if results cannot be independently verified using the reported methods.

Of particular concern is the evaluation of published research in the last five years, particularly in the realm of public health and health policy. Many changes have occurred in the healthcare industry in the past ten years: the adoption of the Health Insurance Portability and Accountability Act, and adapting new technologies have created just as

many problems as they have solved for healthcare managers, to say nothing of the challenges of human resource management and the omnipresent shortage of skilled health professionals. More changes are on the horizon as skyrocketing costs and quality of care issues are moving to the forefront of national discussion. As patients begin to assert themselves and demand social responsibility from providers and payers, new initiatives must be able to withstand analysis from all directions. Most importantly, business proposals are expected to have a basis in scientific research, to prove that the interventions are cost effective and beneficial to the patient. This requires anyone interested in changing the current healthcare system to have a deep understanding of current research, both the positives and negatives, so that their work will hold up if faced with intense scrutiny.

Students of management and administration have a need to develop this understanding, as they will likely be working in many different work environments during the course of their career. Whether in graduate school, non-profit organizations, government, or private industry, knowledge and understanding of trends and changes in healthcare enables an individual to communicate better with their colleagues and superiors, and as managers their time will be severely limited. A literature review conducted at 9 A.M. must be ready to be presented to a client by 1:30 that afternoon – so how can one determine what research is pertinent and worth the extra effort of reading, when every second is precious? The clear answer is by being able to evaluate the methodology to see if research is applicable and meets scientific standards. Methodology that is clear can be easily understood and explained, making a manager more effective in

communicating findings with others who may lack the resources or time invested to be able to understand the findings in their original published form. These needs are the motivation for the research conducted in this trial.

The goal of this research is to discover what trends have taken hold in the field of health research, to analyze current methodologies for construct validity, and to determine external validity as well. Construct validity in methodology is that which refers to the degree that inferences can legitimately be made from the study design, or the understanding of what one is really studying (Trochim, 2005). External validity is whether results can be “generaliz[ed]... to other people, places or times” (Trochim, 2005, p. 49). Another goal of this study is that the reader may use this research to develop a better comprehension of why research methodology must always be questioned and analyzed before it can be accepted as meeting scientific standards.

A sample of recently conducted health care research conducted in management, outside of the clinical setting, will be selected from the population of English language research literature published within the last five years. This literature will be analyzed and presented to the reader, with a discussion of methodology being used in the field today. Further discussion shall include how one may be able to use such research and an understanding of such methodology to become an effective manager in the health services. Conclusions that can be drawn from this review will also be presented, with acknowledgement of any limitations occurring in the course of this experiment and steps for future work.

Review of the Literature

Understanding research in the health professions and being able to question the research of others' are skills that must not be taken lightly. Knowledge of causation and correlation, and the relationship between the two, is imperative. Other factors that should be understood are the development of research in healthcare management to understand what changes have occurred from its inception to the present. There are different types of research possible, and both should be understood to know when each are appropriate. One must always be cognizant of what happens if research fails scientific review.

As demonstrated recently and documented in the New York Times, even highly respected scientists may have to retract their publications from the literature if results cannot be replicated (Chang, 2008). The scientist in the spotlight is a recent Noble prizewinner, who was quoted regarding this incident as saying, "The important thing is to correct the literature" (*Nature* as cited in Chang, 2008). The focused-on researcher was not the lead author, which highlights the responsibilities of secondary investigators to remain involved in any work that they will receive credit for in some form.

Beyond the spectre of falsified or questionable results and conclusions remains the researcher's responsibility to the improvement of human condition. Grol, Baker and Moss (2008) present the importance of quality improvement research and understanding the science of change. Research to improve quality must also have high quality in its research, something which is often lacking, as "randomization or analysis is conducted at the patient level while the intervention focused on professionals" (Grol et al., 2008, p.

10). Grol and his co-authors criticize the current body of research, saying that the same processes are studied over and over, while newer or more complicated processes are neglected in terms of the research being done to study them.

In order to fully study and implement change, a new methodology must be developed, one that is not reliant on one scientific background alone. The proposed science of change should be based on research and studies from the fields of epidemiology, behavioral sciences, education, management, economics and statistics (Grol et al., 2008, p. 111). Grol advocates basing research methodologies on those used in these fields to observe the system from multiple perspectives. A multi-disciplinary approach may hold key to developing comprehensive quality improvement in providing healthcare.

Research in healthcare management is a relative newcomer to the field of study, with the first major step into the field being the study of variations of care. While it was only in the past 25 years that health variations research has taken off, one researcher was pioneering the study of this subject as early as 1936 (McPherson, 2008). McPherson (2008) comments on the trail blazed by Dr. James Alison Glover during the mid-twentieth century and the legacy his work has inspired. This is an important historical figure to consider, as McPherson writes, ‘medical and surgical intervention is still widely regarded as necessarily beneficial for the health of the patient’ (McPherson, 2008, p. 19), something which Dr. Glover was the first to challenge. Glover’s work was primarily studying the variations in tonsillectomy surgery performed for children in England, but

the questions his work raised can be applied to many medical services, wherever “vibrations in utilization rates are unexplained or inexplicable by concomitant variants in morbidity... then *primie facie* evidence about appropriateness of the procedure in questions needs to be sought” (McPherson, p. 20). These variations, in other words, are those that cannot be explained by differences in the population that would provide a legitimate excuse for one group to have more or less surgery when compared to another.

Variation studies often come under attack from providers, as they ‘threaten the clinical freedoms of the medical and surgical professions’ (McPherson, p. 20), freedoms being the physician or surgeon’s medical judgment, based on their education and experience, which may not always be serving the best interest of the patient. This highlights the importance of public health and doing research in the health field, even if “those in public health are seen as interfering busy bodies” (McPherson, p. 20), because by studying the effects of clinical behavior, changes can be made to improve the health of populations. The importance of protecting the public provides another reason to study research methodology. Providers, like most human beings, are loath to accept that they should make changes in how they practice medicine. Research that may affect the practice of medicine must have iron-clad methodology to withstand trial in the court of public opinion.

One potential methodology flaw that reviewers and critics may find is the way in which the research was conducted, either that it was not quantitative enough, or that qualitative data was needed. In conducting research, it is important to note the differences

of qualitative and quantitative research. Quantitative research comes most often from the clinical ‘gold standard’ of a “randomized, prospective, double blind study” (Runciman, 2002, p. 146), but the pitfalls of this kind of research can be logistical, political, financial or ethical, depending on the hypothesis being tested. Qualitative research, in contrast, commonly include interviews, questionnaires, focus groups and observation; this data can be represented quantitatively, but the collection is supplemented by audio and video recordings for accuracy, and answers cannot be computed (Trochim, 2005). Much more can be said about the use of this kind of data.

Qualitative data in management and research is the subject of several books. Evert Gummesson (2000) discusses the challenges associated with, and use of, such data in general business research in his text on *Qualitative Methods in Management Research*. The number one challenge defined is “access to reality”, access meaning the opportunities available to the research to find empirical (real-world) data and information (Gummesson, 2000, p.14). Understanding is both previous (industry-specific) knowledge and insights gained during the research process. Data quality is the third challenge; both quality and understanding require knowledge of the studied industry and its uniqueness, as well as an open mind to see the findings that are less obvious, and consider the validity of a methodology that is not well established (Gummesson, 2000, p. 19). Gummesson (2000) makes a vivid point using the anecdote that “In France even small children speak French fluently”, a reference to tacit knowing, or knowing something you can’t explain. Just as French children cannot explain the intricacies of their native language, researchers must be cautious that they are using information or presenting phenomena they cannot

explain or truly understand (Gummeson, 2000, p. 21). The challenges presented, as well as one of the many lessons offered by the author, ought to be considered by those conducting or reviewing research, no matter the field, but considerations are special to the field of research for health professionals.

Qualitative research conducted for the health professions face more complications than other areas of study because of the stringent guidelines specific to health care and personal health information, which is often the heart of any healthcare study. Finlay and Ballinger (2006) present these complications in *Qualitative Research for Allied Health Professionals: Challenging Choices*, published in 2006 by Wiley. One chapter relevant to this study is “Mapping Methodologies”; the author highlights two points in collecting qualitative data, that the method used is coherent in relation to the methodology, and secondly to be aware of the debates regarding the best way to use a particular method (Finlay, 2006, p. 14-15). That chapter is referenced later within the work, noting that “researchers take different paths depending on the way they view the nature of the social world... and the way knowledge is constructed” (Ballinger, p. 236). Four considerations are presented for research evaluation: “coherence... evidence of systematic and careful research conduct... convincing and relevant interpretation... [and] whether the role of the researcher is accounted for in a way that is consistent with the orientation of the research” (Ballinger, p. 240-242). Research evaluation should study these considerations and methodological guidelines.

In summary, the field of healthcare research is vast, and requires a basic

understanding of the principles of research to properly comprehend. The history of research, which often focuses on variations and improving the quality of care, is short compared to that of the field of medicine. Awareness of the likely reception to one's research is vital; researchers are bound to come under attack from practitioners and must be able to prove their research is sound, or risk the possibility of retraction at a later date. To thus be battle-ready, researchers and those evaluating research must understand the kinds of research, qualitative and quantitative, and know the best applications of each. With this background established, the evaluation of recently published literature can now be discussed.

Methodology

To complete a survey of current methodology, multiple decisions were made for the determination of what research would be considered the base population from which a sample would be selected. It was of utmost concern to the researcher that this sample be representative of the greater population, and that all steps be described in detail, that future replication of this experiment be possible by independent parties, to verify whatever results may be discussed at this time.

The base population will focus on the policy and management research that has been published in the last five years in peer reviewed journals in North America and Great Britain. The pool was limited to articles of non-clinical studies in the field of human health management published in English after January 1, 2002, for the first time in

refereed journals, as found on the Pub Med databases using the keywords "health", "management", "research" and "trial". This search generated 2,412 articles, all of which have been published in the last five years; 2,274 meet further requirements of being in English and On Human Subjects. Further refinement of human subjects was found to be necessary after a trial run of the keywords, without this filter, returned a large amount of veterinary research, which was not the purpose of this study. Research published in English was also found to be a necessary filter, as the original search did not completely exclude research not published in other languages.

The keywords chosen, “health”, “management”, “research” and “trial”, were carefully decided upon by the researcher. The word “health” was chosen as it is the word used to describe the field of research being analyzed, so that similar searches conducted in non-health-specific search engines, such as Google Scholar, would still be relevant to the healthcare industry. The second keyword, “management” was chosen as it would focus the results on research occurring outside of the clinical realm, as the researcher has no qualifications to evaluate research that is clinical in nature. “Research” was the next chosen keyword, because that would remove articles not flagged as being actual research, such as editorials or commentaries, or follow-ups to previously published works. The final keyword, “trial”, was used to distinguish the results from those that were experiments, in case clinical research somehow made it through the previously-established keywords.

The researcher downloaded all of the journals meeting previously stated

qualifications from the Pub Med website as a text file containing all of the citation information. This is the research population, which was then imported into Microsoft Excel. The population data was saved, and a copy containing only the journal name and publication citation was created. During this copy creation, a loss of 38 articles occurred, bringing the population total to 2,236 journal citations. This was a loss of 1.67% of the population, but as over 98% of the original population was retained, the loss was deemed unfortunately but necessary, and not an obstacle to completing the research as intended. An array formula, as used in Excel, computes calculations over groups of rows or columns. An array formula was implemented to determine the number of journals in the total population, which was found to be 758. This copy was imported into SPSS v14.0, and a frequency analysis was performed [Table 1].

This analysis of frequency allowed the researcher to have an accurate count of how many citations were found in the population for each journal. The frequency data was then imported back into Microsoft Excel, where it was sorted on an ascending basis. This listed the journals with one citation in the population, followed by two, to the bottom of the list, which were the titles with the most citations in the population. The greatest number of citations per journals in the population was 37 citations. From there, the population was analyzed for its demographics to determine how to produce the most representative sample.

The frequency demographics [Table 2] were grouped into thirteen categories by the number of citations per journal, with all journals contributing one citation to the

population grouped as “OneCite”, all journals contributing two citations “TwoCite”, etc. up to twelve citations. All journals contributing more than twelve, that is thirteen or higher, up to the highest possible 37 citations per journal, were grouped under the category of “TwlvPlus”. This was determined as the numbering sequence broke after twelve, with no journal contributing thirteen citations. The numbers of citations per journal went to 14, then 15, then 17, 18, 19, 23, 24, 25, 26, and finally 37 citations, for a total of 338 citations among 26 journals. The other end of the spectrum was journals that contributed one citation; there were a total of 387 journals in the population that each presented a single article.

These numbers are close in range, so the researcher determined that this grouping of journals under the category of “TwlvPlus” would keep the sample representative of the population, and prevent it from being over-represented by this category, but also give those journals the adequate representation they deserved. This decision is reflected [Table 3] by noting the percentage each journal category comprises in a pie chart depiction of the population. The smallest category of journal citations, “NineCite” or those journals with nine citations, were 0.87% of the population. This was a category of two journals, with a total of 18 citations. Having just one citation from this category would increase the number needed from all categories, and make the sample unwieldy; this category was eliminated.

The percent each category comprised of the total population was listed in an Excel document, from smallest percent to largest [Table 2]. The percentages were copied

into a new column and were formatted for display as a whole number, with no decimal places given. This eliminated the smallest category, “NineCite”, which rounded to 0. The other categories added to 39; this is the total number of citations needed for the sample.

The sample was drawn by using a random number generator to impartially select the determined number of citations needed from the list of all citations found in each category. In order to do this, the researcher used the data giving frequency [Table 1], to create lists of every complete citation from each journal that would be in each of the thirteen categories. Each of the citations in each individual category was given a number, beginning with 1, to the end of the category. The number ranges for each category thus began at 1. The random number generator used was the one found at www.random.org, which describes itself as “a true random number service that generates randomness via atmospheric noise”. Random.org’s Integer Generator was used to select the citations for the sample. The previously shown [Table 2] shows the determined number of citations required from each category. By using the already established lists of the population, the minimum and maximum integer value for each category was set in the generator. The generator was run for each category, with the numbers recorded. The generated numbers were highlighted in each category, and copied into a new table. This was declared the sample.

The citation information for each randomly selected member of the sample was highlighted within its respective previous category, and copied into a new table. The

information for all sample members were then alphabetized by journal name, and assigned a number, 1 through 39, which would refer to that particular research article for the duration of the study. As the citation available at this point included journal name, year published, volume number, issue number, and the page numbers of each of the selections, the researcher was able to use this information alone to acquire the sample. The majority of the same sample was acquired at Eastern Michigan University's Halle Library. Remaining sample members not available through Halle Library holdings were retrieved on site from the Taubman Library, part of the Michigan Library system of the University of Michigan³.

No article titles were considered at any point of the process during which the sample was selected, to avoid any discrimination or potential bias. Once the researcher had the sample, all articles were read and analyzed. It was determined that the sample could be organized into four non-exclusive categories, with membership in each category meaning that certain criteria were met. The categories were labeled for four different types of healthcare management; each category was considered non-exclusive because findings intended for one particular viewpoint or meeting criteria for one category may be applicable to, or meet criteria in other categories as well.

One determined category was *community health*. To be labeled *community health*, findings had to meet several criteria, assuming that they were not already explicitly indicated as being for the study or benefit of public health. Criteria included the likelihood that public health would be benefited if findings were replicated by a

public health department or community health organization, and if the condition being studied was one already of concern to public and community health managers. A further criterion was that the treatment or program being evaluated in the literature would not pose a significant cost to repeat the steps in a pilot study by another organization. This criterion is especially important to the area of community health, as many organizations serving their communities must do so with limited or no budget for innovations or new programs.

Managed care was a second determined category. Findings given the attribute of managed care were similar to those described as community health, because the goals of managed care organizations are similar to those of community health organizations, in that the general promotion of health and preventive care are emphasized, to avoid costly treatments for complications due to poor health management. The criteria needed to be met were that research was related to promoting better health at the preventive care level, or to improving the maintenance of a chronic condition. Cost saving research was also considered to fit the category of managed care, as related to the provision of acute care. The perspectives of insurance companies were considered both under this category and the next, as they have multiple fiduciary roles in the healthcare system.

The next category can be described as *corporate healthcare management*. Findings in this category are those that could be presented to hospital or health system administrators and administrative management, insurance companies, or other entities in the health system, such as the multitude of private companies that exist to help providers

make sense of their data and reach better decisions. The major criterion required of this category was that the findings would impact a manager's decisions regarding staff hiring, budgeting, pilot study approval, services offered, or major purchases.

Clinical care was the final non-exclusive category, and defined as being research intended for, or of interest to, clinical health care providers, such as physicians, nurses, or allied health professionals. The criteria of this category discussed the actual provision of medical treatment, or issues relating to providing medical care. The focus was on patients' health concerns, rather than addressing the business aspect of healthcare.

To summarize, a sample of literature addressing all aspects of healthcare management was selected from the population of recently published health research literature. The sample was determined by randomly drawing numbers arbitrarily assigned to the citation population, which was categorized by journal prevalence. The citations were viewed without title or author information to avoid bias in the selection process. The intention of this sample selection was to be as representative of the overall population as possible. The sample results will now be presented for review and discussion.

Results

The sample of this research methodology review was retrieved with attention paid to ensure no obvious indication of bias and an equal representation of population

demographics. Categorization of the sample allowed for findings to be classified for better presentation and discussion. Of the operable population of 2,236 articles, a standard representative sample would have been 5% of the population, or 112 articles (Trochim, 2005). A sample of 39 articles was selected as the minimum number that could reasonably be held to be representative in light of time constraints. The sample was found possible to be organized categorically; four non-exclusive categories were defined.

The categorical organization can be seen in [Table 6]: each member of the sample is classified into at least 1 category, with some having applications in up to 3 of the 4 defined categories. Each part of the sample in these categories is hereafter referred to as a “subject”, with the number randomly assigned during the retrieval process. The four categories, as previously mentioned in the methodology section, are clinical care, community health, corporate management, and managed care.

Clinical Care. Of the sampled research, 21 articles were designated as being related to clinical care interests, and 9 of these journal articles were determined to be exclusively clinical in nature, leaving 12 for detailed review. The nine articles that were exclusively clinical discussed such topics as ocular toxoplasmosis, treatments for respiratory failure, prostate carcinoma, and various pharmacological treatments. Exclusively clinical or clinician-directed research was, of the four categories, most likely to use exclusively quantitative methodologies in collecting data. These subjects can be classified further, into a second set of subgroups: pharmacological studies, acute condition studies and chronic condition studies.

One subgroup within clinical care research was based on pharmacological studies; five studies, Subjects 15, 21, 24, 33, and 39 comprised this subgroup. The topics in this subgroup included an extended oral contraceptive regimen, management of Peyronie's Disease, urinary stones, prostate carcinoma, and fecal incontinence. Subject 21, detailing the oral contraceptive study, was a standard clinical trial, and there were few details in the methodology regarding trial participants (Coffee et al, 2007). Subject 39, by comparison, also detailed a clinical trial, with detailed methodology describing the recruitment of adults for the study; this trial was testing differences in treatments for fecal incontinence, the sensitive nature of this topic was noted and much mention made of respecting the dignity of those being recruited (Whitebird et al, 2006). Unlike the other two subjects in this grouping, Subject 24 was not an original clinical trial, but a meta-analysis of recent clinical trials evaluating different methods of treating Peyronie's Disease, which afflicts the male reproductive system (Trost et al, 2007). Subject 15 was a similar study, which evaluated recent clinical trials studying the pharmacological treatment of urinary stone passage; trials were chosen for evaluation using MEDLINE, CINAHL, and EMBASE, and the methodology included the verification of results by a research librarian from a university medical school (Hollingsworth et al, 2006). Subject 33 also discussed an affliction of the male reproductive system, cancer treatment of the prostate gland (Heidenreich et al, 2004). This study was a randomized, controlled clinical trial, which included in its methods an analysis of quality of life during the course of the treatments, although there is no definition of what measures would be used for such a factor (Heidenreich et al, 2004). These studies all evaluated pharmacological treatments

in clinical trials; the next groups are those which examined the clinical treatment of chronic or acute conditions.

Three subjects in the sample described clinical treatment related to a chronic condition; these were subjects 11, 13, and 22, the first two on respiratory failure and the latter on improving patient safety for those using a feeding tube. The two subjects which described studies related to respiratory failure differed in the age groups of patients addressed. Subject 11 was a retrospective study of postoperative respiratory failure in children after adenotonsillectomy; the study did not appear to consider patients prior respiratory condition prior to surgery as a factor leading to a postoperative condition (Brown et al, 2003). Subject 13 is a longitudinal comparison study, which will be conducting an analysis of patient outcomes on a randomly assigned treatment for severe adult respiratory failure (Peek et al., 2006). The research as published is a description of methods and design to be implemented (Peek et al, 2006). The final member of the sample in the group of clinical care research was a study analyzing an acute condition, ocular toxoplasmosis, which was also a review of other published work on the topic (Holland, 2004). These nine subjects were those related only to clinical care management; 50% of the sample pertained in some way to clinical care.

Community Health. The sample yielded 14 articles with applications in community health. Of these 14, community health was the only designation for three articles in the sample. Those three articles presented research on a dating safety awareness program, controlling the spread of trachoma, and the experiences of siblings of Fanconi Anemia

patients. These articles mixed quantitative and qualitative research methods in obtaining data. Subject 9, described a dating violence awareness program, with a randomized trial with three groups of participants: treatment, treatment plus booster, and control (Foshee et al, 2004). The treatment consisted of a 10-week class designed to instill self-esteem, and concepts of what positive and negative dating situations are, to rural middle school students (Foshee et al, 2004). The booster was administered to randomly selected students in the treatment group, and consisted of a mailed newsletter and worksheets that reaffirmed the lessons from the original treatment (Foshee et al, 2004). Data was collected during follow-up periods for the original treatment, however the method of collection is not adequately described. Later follow-up for the booster portion is described as being a phone interview with a health educator, however no description is given in regards to the control or standard treatment groups. This is viewed as a critical potential flaw due to the age group of the participants.

The Fanconi Anemia study directed its focus to the often-neglected healthy siblings of pediatric patients suffering from cancer. This research described itself as pioneering in that it reached out to siblings of living patients, currently undergoing treatment, and specifically sought the sibling's own perspective (Hutson & Alter, 2007). Participants were recruited based on family affiliation with a related protocol from the National Cancer Institute, North American geographical location, being between the ages of 11 and 21, having a sibling living with the condition, and being 100% or 50% biologically related to the patient (Hutson & Alter, 2007). Siblings who gave consent themselves, or affirmed the consent given by his or her parents, were interviewed

numerous times until redundancy was achieved (Hutson & Alter, 2007). Redundancy was stated as being when no new insights were recorded, and “occurred at the seventh interview... two additional interviews [were conducted] to assure saturation” (Hutson & Alter, 2007, p. 73). It is noted in the course of this article that the population was homogenous in regards to race and family status, and that the population was limited to those currently living in North America, for a study examining those impacted by a very rare genetic disorder. No additional information was provided on the incidence of this disorder among racial groups to know whether the Caucasian majority of the population is typical of patients.

There are similarities and key differences among these members of the sample. While both of these subjects report on a study of adolescents, Subject 37 describes conducting multiple interviews with open-ended questions to allow the participants to feel comfortable giving their answers to the investigator (Hutson & Alter, 2007). Subject 9, by contrast, conducted some of its research by telephone in the participants’ homes, where the child may have been within hearing range of his or her parents or guardians, and thus likely to give the answers that the adults present in the home and the surveyors want to hear. No mention is made in the methodology of Subject 9 of any efforts to acknowledge the possible social threats of evaluation apprehension and evaluator expectancies to construct validity on results (Trochim, 2005, p. 59-60). Both articles utilize human subjects in their findings, however Subject 9 draws from a large population, while Subject 37 was limited to seven adolescents for its population base.

The third community-health only article, Subject 34, used a mix of qualitative and quantitative methods in analyzing whether the creation of latrines, without additional health education, would help prevent the spread of trachoma, which is spread by flies attracted to humans' feces and eyes (Emerson et al, 2004). This study, located in Gambia, used quantitative methods that included having a treatment and control group, and placing latrines in measured distances from other community structures to ensure uniformity in safety (Emerson et al, 2004). Quantitatively, this research group documented the participants' eyes for possible trachoma infection prior to constructing the latrines, which included photographs for later data verification by third parties (Emerson et al, 2004). Participants were studied as members of community or family groups and received latrines, insect sprays, or served as a control. One potential flaw not addressed in the methodology was the use of mosquito netting in any group as an additional insect deterrent. It is possible that all or none of the groups had nets, or that nets are not a deterrent to the fly species responsible for the spread of trachoma, although it should be noted that malaria is a public health issue in Gambia⁴. Another possible treatment option is the use of insect sprays in combination with building latrines; this combination of treatments was not studied at the time the research was conducted. It is applauded, however, that all participants received latrines at the end of the study (Emerson et al, 2004); sanitation is a major step in making improvements to public health.

The remaining 11 articles in the category of community health had findings that were applicable to other categories as well. Four in the sample applied to community

health and managed care; Subject 1 discussed the treatment of opium-dependent patients recruited from a general hospital, receiving randomized treatment of either case management, methadone treatment, both or neither (Barnett et al, 2006). Interestingly, the study chose to limit the population to those who had already attempted rehabilitation twice and failed; this group may have been less likely to quit at all, considering that drug use can become a learned behavior, as the brain chemistry is altered by addiction (Robinson & Berridge, 1993). Subject 14, also in this subgroup, was a cluster trial studying obesity management in patients (Moore et al, 2003). The third article in this group, Subject 36, used reading materials, referred to as “bibliotherapy”, which were mailed to older adults identified as “at-risk” by community organizations; the intent of this study was to determine whether these materials would increase the participants’ reported knowledge of fall-avoidance and self-management techniques (Frieswijk et al, 2006). The final article in this group, Subject 38, studied the use of folic acid to stimulate appetite in low-weight children (Hatamizadeh et al, 2007). These subjects will be analyzed further in the discussion section of this paper.

There are three articles relating to community health, managed care, and corporate management. Subject 19 is one of these, reviewing patient self-management programs for chronic conditions, with a focus on those that use laypeople in relaying information (Foster et al, 2007). The use of laypeople makes this article very important to community health organizations, which may face limited funding to pay for clinicians. Similar research was done using laypeople in Subject 23, which studied the use of a telephone call center, staffed with non-clinicians with some training, to improve glucose

monitoring in adults with Type II diabetes (Long et al, 2005). The third member of this group was Subject 27; this sample research sought to improve the health of workers at small businesses using quantitative and qualitative research methods (Hunt et al, 2007). The last article is related to both community health and corporate management, Subject 4, which examined the use of acupuncture to treat pain management during transport for patients with an acute radial fracture (Lang et al, 2007). All of these articles address topics pertinent to public health, and do so in low-cost methods that are possible for community health organizations to replicate.

Corporate Management. There were 16 sample members meeting the qualifications of the label “Corporate Management”; one of these articles was found only under the label of Corporate Management. That article, Subject 17, described a web-based application for managing data entered across a care network (Schmidt et al, 2005). The application allowed for clinicians at any location in the network to access, enter or edit data, providing a cleaner dataset for later uses (Schmidt et al, 2005). This article presented no actual methodology to speak of; it described the software and its uses and limitations in detail (Schmidt et al, 2005). Another way of looking at this sample article would be to describe it as all methodology, with no results, as the process of developing the software is included in the write-up. This subject does not mention any limitations of the new software versus existing methods; one possibility would be that users, particularly those users working in remote locations, could face problems if the available internet connection is not constant or fast enough for the software to run as intended.

Overlapping between categories was a common occurrence for those in the category of corporate management. Overlaps occurred with clinical care six times, managed care three times, and community health once, for those subjects in two categories. Several subjects met criteria for three of the categories used in the sample; three combinations were found of the four possible. Corporate management and managed care overlapped with community health on three subjects, and with clinical care on an additional two.

Managed Care. There were 18 other subjects found in a combination of categories that included managed care. Of these 18 subjects, a single article held only the label of managed care. This subject discussed the results of trials concerning the surgical treatment of low back pain (Bell, 2007). It is reported that the common indications often used to justify the necessity for surgery are able to resolve on their own, with sufficient recovery time, and that surgery should be considered a “lifestyle choice” (Bell, 2007, p. 575). Bell's work is deemed of high interest to those in the field of managed care, as treatment methods available that can avoid unnecessary health risks to the patient and contain costs are looked upon favorably. The promotion of preventive care and cost savings have been determined, for this study, to be in the interest of managed care. Seventeen of the 40 citations used, or roughly half of the subjects gathered for the purpose of this research, met the qualifications for the category of managed care.

Discussion. The results presented thus far paint a colorful and surprising portrait of the variety of research in health care and health management. It was unpredicted at the study

initiation that the sample would obtain subjects addressing a full spectrum of health research. Considering this, the sample may be representative of the field of recently-conducted research. Many of the journal articles found in the sample were unexpected in the study population, considering the research methodology was developed with the intent that none of the sample could be attributed to clinical care alone. The sample yielded 9 of 39, or roughly 25% of subjects meeting this description, an unanticipated and unintended result. This may be attributed to errors in the methodology of this paper; the keywords chosen and previously discussed may not have done an adequate job of screening out clinical research from the population. The keyword “trial” may have been inappropriate for the intention of this work; on review perhaps “study” may have been the better word choice. The only way to know for sure would be to draw a larger sample, or study the entire population. Another way of testing the validity of this word choice would be to run the query with the word “study” in place of trial, redraw the sample and compare the results.

In creating the categories, the researcher noted that many subjects overlapped to two or three types of management. It was additionally noticed that not every possible combination of categories was met, as the combination of corporate management, clinical care, and community health did not occur in the sample. There were also no subjects that could be associated with all four categories, as determined by the researcher. The lack of a subject within the sample having characteristics of corporate, clinical and community management should not be considered evidence for the lack of research in these categories in the greater population. Due to the limited size of the sample population, it is

quite likely that the absence of this combination is due to sampling error. The lack of a subject meeting the criteria of all four categories, on the other hand, may be representative of the population. It is unlikely that research is being conducted on a broad enough scale to meet the criteria of each category; any study having such wide applicability would be exceptionally noteworthy.

Noteworthy results can be found in the course of this study. Two trends were detected in the methodology of the subjects. One detected trend was the number of sample members that had no or scant research methodology of their own to analyze, and were detailed literature reviews. The author believes this is further evidence to the crux of this work, that research must be evaluated even after the point of publication. Recent findings indicate that research and publications may hold surprising secrets, invisible without significant examination (Ross et al, 2008). Literature reviews provide the chance for more remotely published work to be brought to light, in the course of review, and for applications to new industries to be drawn.

Another trend noticed in the process of reviewing the sample subjects was the use of cluster trials in evaluating treatment methods. A cluster trial, as evaluated by Murphy, et al. (2006), involves recruiting a group leader, usually a physician, who agrees to contribute his patient data for the purpose of the study. The groups, rather than the individuals, are randomized for the basis of treatment (Murphy et al., 2006, p. 70). The challenge of this, as Murphy (2006) and his colleagues present, is avoiding contamination of the research subjects. Cluster trials present in the sample of this work do not

adequately describe the methods that may have been designed to prevent this contamination (Kaner et al., 2003), or defer their description by referring to other works (Moore et al., 2003). The research presented by Kaner et al (2003), in fact acknowledges this contamination source in discussing their results; the researchers lost control of the study by allowing physicians and nurses to administer treatment without documentation of treatment provided, or recording the factors used to select patients to receive further screening (Kaner et al., 2003). The prevalence of cluster trials such as these may allow a researcher to obtain a much larger data pool than by conventional methods, but the data from such research cannot be relied upon without further evaluation.

There are other reasons that methodologies from the subjects presented may be held suspect. As previously stated, some chose to refer to previously published work as a basis for their research design, without providing any description of those methods (Moore et al, 2003). References to other works is understandable and necessary, but some explanation must be presented, as it is reasonable to believe that a reader may not have the time necessary to track down the reference to understand the work he or she is reviewing.

Conclusions

The findings reported here may not hold true five years from now, as only literature published between 2002 and 2007 was drawn upon for the purpose of this project. In this same vein, research published prior to 2002 may not hold to the trends

found in the course of this research. This provides a strong indication for the need for continued study of the methodology being used in health research, as research is being conducted and sent to print every day of every year. Future work is called for, to provide a longitudinal perspective to this evolving area of the healthcare arena. Like a traveler with a guidebook, research can be best served by knowing where others have gone before, to see what they have seen, and to expand on their discoveries.

The study of the sample data shows that 50% of subjects have clinical applications, leaving 50% unrelated to clinical care. 25% of the total sample are subjects that pertain only to the clinical field, which is a significant proportion for a sample taken from a population not meant to have any clinical research. This indicates that there is a high likelihood managers may encounter challenges when conducting searches of recently published healthcare findings. This finding is vital because of the lack of students enrolled in healthcare-specific administrative and management degrees; many students who find a career in healthcare management or administration have not had preparation in the health sciences or even studied medical terminology⁵. This leads to the possibility of having managers in place, and people with decision-making capabilities, who, through no fault of their own, do not have a comprehensive understanding of the complexities of healthcare. These decision-makers have a need to quickly evaluate what literature is worth their time and effort in reading, and may have to turn to other individuals for help in doing so.

Research and methodologies must be evaluated, even after publication, because

important decisions may be based on those findings. This is evident in a just-published review of studies related to rofecoxib, sold as the prescription drug Vioxx; many studies on this subject are revealing themselves to be written by the manufacturer, with a prominent researcher's name given as the author (Ross et al, 2008). Peer reviewed research journals could have between 13% and 16% of articles being written by an uncredited author (Ross et al, 2008, p. 1800). This startling figure highlights that decision-makers and managers may not have the background necessary to evaluate research with their own skill set. New ways of dispersing information must be introduced. With proper knowledge sharing, those who have evaluated research can put those findings into the hands of those who can put it to use. The author concludes that new channels must be introduced to verify the originality and validity of research data, and to put that data in the hands of managers.

The industry of healthcare is unique in its dual-fiduciary role, in which providers and other entities are expected to spare no expense in providing care today, and yet be able to provide the same level of care tomorrow. The challenges and flaws of this system are far too numerous for one author to attempt to address, in one work alone. By analyzing the current research being conducted in the field of healthcare, and the methods by which that research is being conducted, managers may develop a better understanding of the industry in which they work. That understanding can only benefit the patients, colleagues, supervisors, and other clients the manager serves. With knowledge reaching the people who can best put that understanding to work, can the problems of the much-maligned healthcare system be intelligently addressed.

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Footnotes

1. Result of first-hand investigation searching for any article added in 3 separate 30-day time periods and averaged together.
2. The monthly average of 50,000 articles multiplied by 12, verified through an additional search of articles on any subject added in the last 12 months.
3. Ryan Selleck is thanked for his help in this retrieval.
4. The requirement of a vaccine for malaria for those traveling to Gambia was used as evidence that malaria is still a public health consideration for this part of the globe.
5. Based on personal experience in a corporate healthcare setting. Business acumen is valued in candidates ahead of knowledge of the intricacies of healthcare, although students with such knowledge are especially valued, most new hires have backgrounds in general business school offerings, such as marketing and finance, and must undergo extensive 'on the job' training to develop a better understanding of health phenomena.

Table 1. Journals from the Population by Descending Frequency.

Journals	Frequency	Percent	Valid Percent	Cumulative Percent
Acad Med	1	0.044722719	0.044722719	0.447227191
Account Res	1	0.044722719	0.044722719	0.491949911
Acta Anaesthesiol Scand	1	0.044722719	0.044722719	0.53667263
Acta Biomed	1	0.044722719	0.044722719	0.581395349
Acta Neurochir Suppl	1	0.044722719	0.044722719	0.626118068
Acta Neurol Taiwan	1	0.044722719	0.044722719	0.670840787
Acta Psychiatr Scand	1	0.044722719	0.044722719	0.805008945
Adm Policy Ment Health	1	0.044722719	0.044722719	1.520572451
Adv Exp Med Biol	1	0.044722719	0.044722719	1.56529517
Adv Skin Wound Care	1	0.044722719	0.044722719	1.610017889
Aging Clin Exp Res	1	0.044722719	0.044722719	1.923076923
Aging Ment Health	1	0.044722719	0.044722719	1.967799642
AIDS Patient Care STDS	1	0.044722719	0.044722719	2.325581395
AIDS Res Hum Retroviruses	1	0.044722719	0.044722719	2.370304114
AJNR Am J Neuroradiol	1	0.044722719	0.044722719	2.415026834
Allergy	1	0.044722719	0.044722719	2.862254025
Altern Ther Health Med	1	0.044722719	0.044722719	2.906976744
Am Ann Deaf	1	0.044722719	0.044722719	2.951699463
Am Heart Hosp J	1	0.044722719	0.044722719	2.996422182
Am J Alzheimers Dis Other Demen	1	0.044722719	0.044722719	3.66726297
Am J Cardiovasc Drugs	1	0.044722719	0.044722719	4.114490161
Am J Clin Dermatol	1	0.044722719	0.044722719	4.15921288
Am J Community Psychol	1	0.044722719	0.044722719	4.293381038
Am J Drug Alcohol Abuse	1	0.044722719	0.044722719	4.427549195
Am J Epidemiol	1	0.044722719	0.044722719	4.606440072
Am J Geriatr Cardiol	1	0.044722719	0.044722719	4.785330948
Am J Health Behav	1	0.044722719	0.044722719	5.053667263
Am J Health Promot	1	0.044722719	0.044722719	5.098389982
Am J Hematol	1	0.044722719	0.044722719	5.277280859
Am J Med Sci	1	0.044722719	0.044722719	7.245080501
Am J Nephrol	1	0.044722719	0.044722719	7.28980322
Am J Ophthalmol	1	0.044722719	0.044722719	7.692307692
Am J Pharmacogenomics	1	0.044722719	0.044722719	7.737030411
Am J Phys Med Rehabil	1	0.044722719	0.044722719	7.781753131

Table 1. Journals from the Population by Descending Frequency.

Am J Sports Med	1	0.044722719	0.044722719	8.407871199
Am J Surg	1	0.044722719	0.044722719	8.452593918
Am Surg	1	0.044722719	0.044722719	8.586762075
Amyotroph Lateral Scler	1	0.044722719	0.044722719	8.765652952
Amyotroph Lateral Scler Other Motor Neuron				
Disord	1	0.044722719	0.044722719	8.810375671
Ann N Y Acad Sci	1	0.044722719	0.044722719	11.27012522
Anticancer Res	1	0.044722719	0.044722719	11.80679785
Antivir Ther	1	0.044722719	0.044722719	11.85152057
Appl Ergon	1	0.044722719	0.044722719	11.89624329
Appl Health Econ Health Policy	1	0.044722719	0.044722719	11.94096601
Arch Ophthalmol	1	0.044722719	0.044722719	13.50626118
Arch Pathol Lab Med	1	0.044722719	0.044722719	13.5509839
Arch Surg	1	0.044722719	0.044722719	14.13237925
Aust Health Rev	1	0.044722719	0.044722719	15.07155635
Aust N Z J Public Health	1	0.044722719	0.044722719	15.6529517
Australas Psychiatry	1	0.044722719	0.044722719	15.69767442
Behav Sci Law	1	0.044722719	0.044722719	15.83184258
Best Pract Res Clin Obstet Gynaecol	1	0.044722719	0.044722719	15.8765653
Biol Neonate	1	0.044722719	0.044722719	15.92128801
Birth	1	0.044722719	0.044722719	16.14490161
BMC Infect Dis	1	0.044722719	0.044722719	18.55992844
BMC Neurol	1	0.044722719	0.044722719	19.6332737
BMC Pediatr	1	0.044722719	0.044722719	19.67799642
Br Dent J	1	0.044722719	0.044722719	21.82468694
Br J Community Nurs	1	0.044722719	0.044722719	22.40608229
Br J Psychiatry Suppl	1	0.044722719	0.044722719	23.8372093
Brain	1	0.044722719	0.044722719	24.15026834
Brain Inj	1	0.044722719	0.044722719	24.19499106
Braz Oral Res	1	0.044722719	0.044722719	24.23971377
Breast	1	0.044722719	0.044722719	24.28443649
Breast Cancer Res Treat	1	0.044722719	0.044722719	24.32915921
Can Fam Physician	1	0.044722719	0.044722719	24.59749553
Can J Aging	1	0.044722719	0.044722719	24.64221825
Can J Cardiovasc Nurs	1	0.044722719	0.044722719	24.91055456
Can J Public Health	1	0.044722719	0.044722719	25.04472272
Can J Rural Med	1	0.044722719	0.044722719	25.08944544

Table 1. Journals from the Population by Descending Frequency.

Can J Surg	1	0.044722719	0.044722719	25.13416816
Can Oncol Nurs J	1	0.044722719	0.044722719	25.17889088
Can Oper Room Nurs J	1	0.044722719	0.044722719	25.2236136
Cancer Invest	1	0.044722719	0.044722719	25.9391771
Cardiol Rev	1	0.044722719	0.044722719	26.25223614
Cardiovasc Hematol Disord Drug Targets	1	0.044722719	0.044722719	26.29695886
Child Abuse Negl	1	0.044722719	0.044722719	27.1019678
Child Neuropsychol	1	0.044722719	0.044722719	27.23613596
Circ J	1	0.044722719	0.044722719	27.59391771
CJEM	1	0.044722719	0.044722719	27.95169946
Cleft Palate Craniofac J	1	0.044722719	0.044722719	27.99642218
Cleve Clin J Med	1	0.044722719	0.044722719	28.0411449
Climacteric	1	0.044722719	0.044722719	28.08586762
Clin Cardiol	1	0.044722719	0.044722719	28.13059034
Clin J Sport Med	1	0.044722719	0.044722719	29.11449016
Clin Neuropharmacol	1	0.044722719	0.044722719	29.15921288
Clin Neurophysiol	1	0.044722719	0.044722719	29.2039356
CNS Drugs	1	0.044722719	0.044722719	30.41144902
CNS Spectr	1	0.044722719	0.044722719	30.45617174
Cogn Behav Ther	1	0.044722719	0.044722719	32.15563506
Community Dent Oral Epidemiol	1	0.044722719	0.044722719	32.20035778
Community Ment Health J	1	0.044722719	0.044722719	32.2450805
Compr Psychiatry	1	0.044722719	0.044722719	32.28980322
Congest Heart Fail	1	0.044722719	0.044722719	32.33452594
Contemp Nurse	1	0.044722719	0.044722719	33.00536673
Contrib Nephrol	1	0.044722719	0.044722719	33.13953488
Crit Care	1	0.044722719	0.044722719	33.36314848
Crit Care Resusc	1	0.044722719	0.044722719	33.63148479
Crit Pathw Cardiol	1	0.044722719	0.044722719	33.67620751
Curr Cardiol Rep	1	0.044722719	0.044722719	33.72093023
Curr Hypertens Rep	1	0.044722719	0.044722719	33.76565295
Curr Opin Allergy Clin Immunol	1	0.044722719	0.044722719	34.30232558
Curr Opin Nephrol Hypertens	1	0.044722719	0.044722719	34.3470483
Curr Opin Ophthalmol	1	0.044722719	0.044722719	34.39177102
Dev Med Child Neurol	1	0.044722719	0.044722719	34.74955277
Disabil Rehabil	1	0.044722719	0.044722719	38.10375671
Drug Saf	1	0.044722719	0.044722719	38.37209302

Table 1. Journals from the Population by Descending Frequency.

Drugs R D	1	0.044722719	0.044722719	38.64042934
East Afr J Public Health	1	0.044722719	0.044722719	38.68515206
Eat Behav	1	0.044722719	0.044722719	38.72987478
Eat Weight Disord	1	0.044722719	0.044722719	38.7745975
Educ Health (Abingdon)	1	0.044722719	0.044722719	38.81932021
Emerg Med Australas	1	0.044722719	0.044722719	38.86404293
Endocrine	1	0.044722719	0.044722719	38.99821109
Ethn Health	1	0.044722719	0.044722719	39.7137746
Eur Addict Res	1	0.044722719	0.044722719	39.75849732
Eur J Cancer	1	0.044722719	0.044722719	39.80322004
Eur J Clin Pharmacol	1	0.044722719	0.044722719	40.07155635
Eur J Gastroenterol Hepatol	1	0.044722719	0.044722719	40.29516995
Eur J Gen Pract	1	0.044722719	0.044722719	40.33989267
Eur J Health Econ	1	0.044722719	0.044722719	40.38461538
Eur J Pain	1	0.044722719	0.044722719	41.18962433
Eur J Public Health	1	0.044722719	0.044722719	41.23434705
Eur Psychiatry	1	0.044722719	0.044722719	41.36851521
Eval Health Prof	1	0.044722719	0.044722719	41.99463327
Eval Rev	1	0.044722719	0.044722719	42.03935599
Expert Opin Emerg Drugs	1	0.044722719	0.044722719	42.21824687
Expert Opin Investig Drugs	1	0.044722719	0.044722719	42.26296959
Expert Rev Anticancer Ther	1	0.044722719	0.044722719	42.30769231
Explore (NY)	1	0.044722719	0.044722719	42.35241503
Feb;26(2):186	1	0.044722719	0.044722719	43.06797853
Gerontol Geriatr Educ	1	0.044722719	0.044722719	43.82826476
Haemophilia	1	0.044722719	0.044722719	44.40966011
Head Neck	1	0.044722719	0.044722719	44.45438283
Health Care Financ Rev	1	0.044722719	0.044722719	44.67799642
Health Care Women Int	1	0.044722719	0.044722719	44.72271914
Health Econ	1	0.044722719	0.044722719	44.76744186
Health Info Libr J	1	0.044722719	0.044722719	44.99105546
Health Place	1	0.044722719	0.044722719	45.03577818
Health Policy Plan	1	0.044722719	0.044722719	45.21466905
Health Soc Care Community	1	0.044722719	0.044722719	46.37745975
Heart Fail Rev	1	0.044722719	0.044722719	47.36135957
Heart Surg Forum	1	0.044722719	0.044722719	47.71914132
Helicobacter	1	0.044722719	0.044722719	47.76386404

Table 1. Journals from the Population by Descending Frequency.

Hemodial Int	1	0.044722719	0.044722719	47.80858676
HIV Clin Trials	1	0.044722719	0.044722719	47.85330948
Homeopathy	1	0.044722719	0.044722719	48.21109123
Hypertens Res	1	0.044722719	0.044722719	48.25581395
IEEE Trans Inf Technol Biomed	1	0.044722719	0.044722719	48.30053667
Indoor Air	1	0.044722719	0.044722719	48.34525939
Inflamm Bowel Dis	1	0.044722719	0.044722719	48.47942755
Int Arch Allergy Immunol	1	0.044722719	0.044722719	48.70304114
Int Braz J Urol	1	0.044722719	0.044722719	48.88193202
Int J Antimicrob Agents	1	0.044722719	0.044722719	48.92665474
Int J Artif Organs	1	0.044722719	0.044722719	48.97137746
Int J Behav Med	1	0.044722719	0.044722719	49.01610018
Int J Cancer	1	0.044722719	0.044722719	49.0608229
Int J Chron Obstruct Pulmon Dis	1	0.044722719	0.044722719	49.10554562
Int J Clin Pharmacol Ther	1	0.044722719	0.044722719	49.15026834
Int J Colorectal Dis	1	0.044722719	0.044722719	49.37388193
Int J Eat Disord	1	0.044722719	0.044722719	49.41860465
Int J Epidemiol	1	0.044722719	0.044722719	49.46332737
Int J Food Sci Nutr	1	0.044722719	0.044722719	49.50805009
Int J Geriatr Psychiatry	1	0.044722719	0.044722719	49.55277281
Int J Gynecol Cancer	1	0.044722719	0.044722719	49.82110912
Int J Lang Commun Disord	1	0.044722719	0.044722719	49.95527728
Int J Neurosci	1	0.044722719	0.044722719	50.08944544
Int J Nurs Terminol Classif	1	0.044722719	0.044722719	50.31305903
Int J Obes (Lond)	1	0.044722719	0.044722719	50.35778175
Int J Palliat Nurs	1	0.044722719	0.044722719	50.49194991
Int J Pediatr Otorhinolaryngol	1	0.044722719	0.044722719	50.53667263
Int J Prosthodont	1	0.044722719	0.044722719	50.58139535
Int J Public Health	1	0.044722719	0.044722719	50.71556351
Int J Sport Nutr Exerc Metab	1	0.044722719	0.044722719	50.9391771
Integr Cancer Ther	1	0.044722719	0.044722719	51.65474061
Intern Emerg Med	1	0.044722719	0.044722719	51.69946333
Intern Med	1	0.044722719	0.044722719	51.74418605
Isr Med Assoc J	1	0.044722719	0.044722719	51.8783542
Issues Compr Pediatr Nurs	1	0.044722719	0.044722719	51.92307692
J Abnorm Child Psychol	1	0.044722719	0.044722719	51.96779964
J Am Board Fam Pract	1	0.044722719	0.044722719	54.56171735

Table 1. Journals from the Population by Descending Frequency.

J Am Coll Nutr	1	0.044722719	0.044722719	54.83005367
J Am Dent Assoc	1	0.044722719	0.044722719	55.05366726
J Am Mosq Control Assoc	1	0.044722719	0.044722719	56.3059034
J Am Pharm Assoc (2003)	1	0.044722719	0.044722719	56.35062612
J Am Podiatr Med Assoc	1	0.044722719	0.044722719	56.39534884
J Ambul Care Manage	1	0.044722719	0.044722719	56.61896243
J Ark Med Soc	1	0.044722719	0.044722719	56.66368515
J Arthroplasty	1	0.044722719	0.044722719	56.70840787
J Biomed Inform	1	0.044722719	0.044722719	57.2450805
J Burn Care Res	1	0.044722719	0.044722719	57.55813953
J Card Surg	1	0.044722719	0.044722719	57.96064401
J Cardiometab Syndr	1	0.044722719	0.044722719	58.00536673
J Cardiovasc Pharmacol Ther	1	0.044722719	0.044722719	58.49731664
J Cataract Refract Surg	1	0.044722719	0.044722719	58.54203936
J Child Health Care	1	0.044722719	0.044722719	58.58676208
J Clin Apher	1	0.044722719	0.044722719	58.63148479
J Clin Densitom	1	0.044722719	0.044722719	58.67620751
J Clin Endocrinol Metab	1	0.044722719	0.044722719	58.72093023
J Clin Hypertens (Greenwich)	1	0.044722719	0.044722719	59.03398927
J Clin Neurosci	1	0.044722719	0.044722719	59.07871199
J Clin Pathol	1	0.044722719	0.044722719	60.64400716
J Community Health	1	0.044722719	0.044722719	61.13595707
J Contin Educ Nurs	1	0.044722719	0.044722719	61.94096601
J Digit Imaging	1	0.044722719	0.044722719	62.07513417
J Environ Monit	1	0.044722719	0.044722719	62.20930233
J Epidemiol	1	0.044722719	0.044722719	62.25402504
J Ethnopharmacol	1	0.044722719	0.044722719	62.3881932
J Eur Acad Dermatol Venereol	1	0.044722719	0.044722719	62.43291592
J Fam Plann Reprod Health Care	1	0.044722719	0.044722719	62.79069767
J Fam Pract	1	0.044722719	0.044722719	62.83542039
J Gastroenterol Hepatol	1	0.044722719	0.044722719	62.88014311
J Gastrointest Surg	1	0.044722719	0.044722719	62.92486583
J Genet Couns	1	0.044722719	0.044722719	63.7745975
J Gerontol B Psychol Sci Soc Sci	1	0.044722719	0.044722719	64.04293381
J Hand Ther	1	0.044722719	0.044722719	64.17710197
J Health Adm Educ	1	0.044722719	0.044722719	64.22182469
J Health Care Poor Underserved	1	0.044722719	0.044722719	64.26654741

Table 1. Journals from the Population by Descending Frequency.

J Health Psychol	1	0.044722719	0.044722719	64.490161
J Health Serv Res Policy	1	0.044722719	0.044722719	64.53488372
J Healthc Manag	1	0.044722719	0.044722719	64.57960644
J Healthc Qual	1	0.044722719	0.044722719	64.62432916
J Hosp Infect	1	0.044722719	0.044722719	64.66905188
J Hum Nutr Diet	1	0.044722719	0.044722719	64.84794275
J Int Acad Periodontol	1	0.044722719	0.044722719	65.07155635
J Int Med Res	1	0.044722719	0.044722719	65.11627907
J Interprof Care	1	0.044722719	0.044722719	65.16100179
J Invasive Cardiol	1	0.044722719	0.044722719	65.29516995
J Laryngol Otol	1	0.044722719	0.044722719	65.33989267
J Low Genit Tract Dis	1	0.044722719	0.044722719	65.38461538
J Med Entomol	1	0.044722719	0.044722719	65.69767442
J Med Food	1	0.044722719	0.044722719	65.74239714
J Med Screen	1	0.044722719	0.044722719	65.96601073
J Natl Cancer Inst	1	0.044722719	0.044722719	66.18962433
J Natl Cancer Inst Monogr	1	0.044722719	0.044722719	66.23434705
J Nephrol	1	0.044722719	0.044722719	66.27906977
J Nerv Ment Dis	1	0.044722719	0.044722719	66.32379249
J Neurol	1	0.044722719	0.044722719	66.36851521
J Neurol Sci	1	0.044722719	0.044722719	66.5921288
J Neurosci Nurs	1	0.044722719	0.044722719	66.63685152
J Neurosurg Spine	1	0.044722719	0.044722719	66.68157424
J Neurotrauma	1	0.044722719	0.044722719	66.72629696
J Nurs Adm	1	0.044722719	0.044722719	66.77101968
J Nurs Care Qual	1	0.044722719	0.044722719	66.8157424
J Nurses Staff Dev	1	0.044722719	0.044722719	67.44186047
J Occup Environ Med	1	0.044722719	0.044722719	67.66547406
J Oral Pathol Med	1	0.044722719	0.044722719	68.02325581
J Orthop Trauma	1	0.044722719	0.044722719	68.06797853
J Pain	1	0.044722719	0.044722719	68.20214669
J Pak Med Assoc	1	0.044722719	0.044722719	68.87298748
J Pediatr Hematol Oncol	1	0.044722719	0.044722719	69.40966011
J Pediatr Nurs	1	0.044722719	0.044722719	69.45438283
J Pediatr Surg	1	0.044722719	0.044722719	69.49910555
J Perinat Neonatal Nurs	1	0.044722719	0.044722719	69.54382826
J Pers Soc Psychol	1	0.044722719	0.044722719	69.8568873

Table 1. Journals from the Population by Descending Frequency.

J Prim Prev	1	0.044722719	0.044722719	69.90161002
J Psychiatr Res	1	0.044722719	0.044722719	70.08050089
J Public Health (Oxf)	1	0.044722719	0.044722719	70.25939177
J Rehabil Res Dev	1	0.044722719	0.044722719	70.30411449
J Reprod Med	1	0.044722719	0.044722719	70.34883721
J Rheumatol Suppl	1	0.044722719	0.044722719	70.93023256
J Sch Nurs	1	0.044722719	0.044722719	71.46690519
J Sci Med Sport	1	0.044722719	0.044722719	71.51162791
J Sex Med	1	0.044722719	0.044722719	71.55635063
J Spinal Cord Med	1	0.044722719	0.044722719	71.60107335
J Strength Cond Res	1	0.044722719	0.044722719	71.64579606
J Stroke Cerebrovasc Dis	1	0.044722719	0.044722719	71.69051878
J Subst Abuse Treat	1	0.044722719	0.044722719	72.00357782
J Support Oncol	1	0.044722719	0.044722719	72.04830054
J Trauma Stress	1	0.044722719	0.044722719	72.58497317
J Urol	1	0.044722719	0.044722719	72.94275492
J Vasc Interv Radiol	1	0.044722719	0.044722719	72.98747764
J Vasc Nurs	1	0.044722719	0.044722719	73.03220036
J Vasc Surg	1	0.044722719	0.044722719	73.07692308
J Women Aging	1	0.044722719	0.044722719	73.1216458
Jpn J Clin Oncol	1	0.044722719	0.044722719	74.59749553
Jpn J Infect Dis	1	0.044722719	0.044722719	74.64221825
Jt Comm J Qual Patient Saf	1	0.044722719	0.044722719	74.68694097
Kaohsiung J Med Sci	1	0.044722719	0.044722719	74.73166369
Kidney Int	1	0.044722719	0.044722719	74.7763864
Kidney Int Suppl	1	0.044722719	0.044722719	74.82110912
Lancet Infect Dis	1	0.044722719	0.044722719	75.35778175
Lancet Neurol	1	0.044722719	0.044722719	75.40250447
Mayo Clin Proc	1	0.044722719	0.044722719	75.67084079
Med Clin North Am	1	0.044722719	0.044722719	76.61001789
Med Educ	1	0.044722719	0.044722719	77.1019678
Med Inform Internet Med	1	0.044722719	0.044722719	77.23613596
Med Pediatr Oncol	1	0.044722719	0.044722719	77.45974955
MedGenMed	1	0.044722719	0.044722719	77.50447227
Medinfo	1	0.044722719	0.044722719	77.54919499
Ment Health Serv Res	1	0.044722719	0.044722719	77.59391771
Mil Med	1	0.044722719	0.044722719	77.72808587

Table 1. Journals from the Population by Descending Frequency.

Minn Med	1	0.044722719	0.044722719	77.86225403
Mol Med	1	0.044722719	0.044722719	77.90697674
Monaldi Arch Chest Dis	1	0.044722719	0.044722719	77.95169946
Mult Scler	1	0.044722719	0.044722719	78.08586762
N C Med J	1	0.044722719	0.044722719	78.13059034
N Z Med J	1	0.044722719	0.044722719	78.39892665
Nat Clin Pract Cardiovasc Med	1	0.044722719	0.044722719	78.44364937
Nephrol Dial Transplant	1	0.044722719	0.044722719	78.48837209
Neuroepidemiology	1	0.044722719	0.044722719	78.53309481
Neurorehabil Neural Repair	1	0.044722719	0.044722719	78.75670841
Nicotine Tob Res	1	0.044722719	0.044722719	79.06976744
Novartis Found Symp	1	0.044722719	0.044722719	79.11449016
Nurs Ethics	1	0.044722719	0.044722719	79.15921288
Nurs Outlook	1	0.044722719	0.044722719	79.33810376
Nurs Sci Q	1	0.044722719	0.044722719	79.69588551
Nurse Educ	1	0.044722719	0.044722719	79.83005367
Nutrition	1	0.044722719	0.044722719	79.96422182
Obstet Gynecol Surv	1	0.044722719	0.044722719	80.94812165
Ocul Immunol Inflamm	1	0.044722719	0.044722719	81.0822898
Oncologist	1	0.044722719	0.044722719	81.61896243
Onkologie	1	0.044722719	0.044722719	81.66368515
Oral Health Prev Dent	1	0.044722719	0.044722719	81.79785331
Oral Oncol	1	0.044722719	0.044722719	81.84257603
Orthop Nurs	1	0.044722719	0.044722719	81.88729875
Osteoarthritis Cartilage	1	0.044722719	0.044722719	81.93202147
Otolaryngol Head Neck Surg	1	0.044722719	0.044722719	82.20035778
Outcomes Manag	1	0.044722719	0.044722719	82.2450805
P R Health Sci J	1	0.044722719	0.044722719	82.28980322
Pacing Clin Electrophysiol	1	0.044722719	0.044722719	82.33452594
Paediatr Perinat Epidemiol	1	0.044722719	0.044722719	82.4686941
Pain Res Manag	1	0.044722719	0.044722719	83.63148479
Pediatr Clin North Am	1	0.044722719	0.044722719	85.46511628
Pediatr Dent	1	0.044722719	0.044722719	85.59928444
Pediatr Infect Dis J	1	0.044722719	0.044722719	85.77817531
Pediatr Int	1	0.044722719	0.044722719	85.82289803
Pediatr Nurs	1	0.044722719	0.044722719	85.86762075
Percept Mot Skills	1	0.044722719	0.044722719	87.11985689

Table 1. Journals from the Population by Descending Frequency.

Perspect Psychiatr Care	1	0.044722719	0.044722719	87.16457961
Perspect Vasc Surg Endovasc Ther	1	0.044722719	0.044722719	87.20930233
Pharm World Sci	1	0.044722719	0.044722719	87.25402504
Pharmacopsychiatry	1	0.044722719	0.044722719	87.70125224
Photodermatol Photoimmunol Photomed	1	0.044722719	0.044722719	87.96958855
Physiol Behav	1	0.044722719	0.044722719	88.28264758
Physiol Meas	1	0.044722719	0.044722719	88.3273703
Prehosp Emerg Care	1	0.044722719	0.044722719	88.59570662
Prim Care Respir J	1	0.044722719	0.044722719	89.35599284
Proc Natl Acad Sci U S A	1	0.044722719	0.044722719	89.40071556
Prof Nurse	1	0.044722719	0.044722719	89.44543828
Prog Brain Res	1	0.044722719	0.044722719	89.490161
Prog Cardiovasc Nurs	1	0.044722719	0.044722719	89.53488372
Psychiatr Danub	1	0.044722719	0.044722719	89.66905188
Psychiatr Rehabil J	1	0.044722719	0.044722719	89.80322004
Psychopharmacology (Berl)	1	0.044722719	0.044722719	91.77101968
Psychother Psychosom	1	0.044722719	0.044722719	92.12880143
Public Health Nutr	1	0.044722719	0.044722719	92.30769231
QJM	1	0.044722719	0.044722719	92.35241503
Qual Health Res	1	0.044722719	0.044722719	92.39713775
Qual Manag Health Care	1	0.044722719	0.044722719	92.57602862
Reprod Health Matters	1	0.044722719	0.044722719	93.29159213
Respir Res	1	0.044722719	0.044722719	93.87298748
Respiration	1	0.044722719	0.044722719	93.9177102
Rev Panam Salud Publica	1	0.044722719	0.044722719	94.18604651
Rev Sci Tech	1	0.044722719	0.044722719	94.23076923
Rheumatol Int	1	0.044722719	0.044722719	94.27549195
Risk Anal	1	0.044722719	0.044722719	94.67799642
Scand J Infect Dis	1	0.044722719	0.044722719	95.03577818
Scand J Prim Health Care	1	0.044722719	0.044722719	95.08050089
Scand J Work Environ Health	1	0.044722719	0.044722719	95.30411449
Schizophr Res	1	0.044722719	0.044722719	95.48300537
Sci Total Environ	1	0.044722719	0.044722719	95.52772809
Science	1	0.044722719	0.044722719	95.57245081
Semin Fetal Neonatal Med	1	0.044722719	0.044722719	95.61717352
Semin Perinatol	1	0.044722719	0.044722719	95.7960644
Sleep Med	1	0.044722719	0.044722719	96.019678

Table 1. Journals from the Population by Descending Frequency.

Southeast Asian J Trop Med Public Health	1	0.044722719	0.044722719	96.51162791
Spine J	1	0.044722719	0.044722719	97.09302326
Sports Med	1	0.044722719	0.044722719	97.13774597
Strahlenther Onkol	1	0.044722719	0.044722719	97.31663685
Stud Health Technol Inform	1	0.044722719	0.044722719	97.71914132
Surg Endosc	1	0.044722719	0.044722719	97.8980322
Surg Infect (Larchmt)	1	0.044722719	0.044722719	97.94275492
Swiss Med Wkly	1	0.044722719	0.044722719	97.98747764
Tanzan Health Res Bull	1	0.044722719	0.044722719	98.1216458
Ther Drug Monit	1	0.044722719	0.044722719	98.34525939
Thromb Haemost	1	0.044722719	0.044722719	98.52415027
Thromb Res	1	0.044722719	0.044722719	98.56887299
Tob Control	1	0.044722719	0.044722719	98.61359571
Trans R Soc Trop Med Hyg	1	0.044722719	0.044722719	98.65831843
Trop Doct	1	0.044722719	0.044722719	98.70304114
Urol Oncol	1	0.044722719	0.044722719	99.01610018
Vasc Health Risk Manag	1	0.044722719	0.044722719	99.46332737
Vasc Med	1	0.044722719	0.044722719	99.50805009
Women Health	1	0.044722719	0.044722719	99.64221825
Work	1	0.044722719	0.044722719	99.7763864
Z Kardiol	1	0.044722719	0.044722719	100
AAOHN J	2	0.089445438	0.089445438	0.089445438
Acta Paediatr	2	0.089445438	0.089445438	0.760286225
Acta Trop	2	0.089445438	0.089445438	0.894454383
AIDS	2	0.089445438	0.089445438	2.057245081
AIDS Care	2	0.089445438	0.089445438	2.280858676
Alcohol Alcohol	2	0.089445438	0.089445438	2.504472272
Alcohol Clin Exp Res	2	0.089445438	0.089445438	2.59391771
Am J Addict	2	0.089445438	0.089445438	3.62254025
Am J Clin Nutr	2	0.089445438	0.089445438	4.248658318
Am J Crit Care	2	0.089445438	0.089445438	4.382826476
Am J Geriatr Pharmacother	2	0.089445438	0.089445438	4.874776386
Am J Hypertens	2	0.089445438	0.089445438	5.366726297
Am J Ind Med	2	0.089445438	0.089445438	5.456171735
Am J Nurs	2	0.089445438	0.089445438	7.379248658
Am J Occup Ther	2	0.089445438	0.089445438	7.647584973
Am J Prev Med	2	0.089445438	0.089445438	7.871198569

Table 1. Journals from the Population by Descending Frequency.

Am J Trop Med Hyg	2	0.089445438	0.089445438	8.542039356
Anaesth Intensive Care	2	0.089445438	0.089445438	8.899821109
Ann Acad Med Singapore	2	0.089445438	0.089445438	9.615384615
Ann Emerg Med	2	0.089445438	0.089445438	10.2862254
Appl Nurs Res	2	0.089445438	0.089445438	12.03041145
Arch Dis Child	2	0.089445438	0.089445438	12.11985689
Arch Phys Med Rehabil	2	0.089445438	0.089445438	14.08765653
Asia Pac J Clin Nutr	2	0.089445438	0.089445438	14.84794275
Aust J Physiother	2	0.089445438	0.089445438	15.29516995
Aust J Rural Health	2	0.089445438	0.089445438	15.38461538
Aust N Z J Psychiatry	2	0.089445438	0.089445438	15.60822898
Behav Res Ther	2	0.089445438	0.089445438	15.78711986
Biol Res Nurs	2	0.089445438	0.089445438	16.01073345
Bipolar Disord	2	0.089445438	0.089445438	16.10017889
BMC Geriatr	2	0.089445438	0.089445438	17.66547406
BMC Nephrol	2	0.089445438	0.089445438	19.58855098
Br J Clin Pharmacol	2	0.089445438	0.089445438	22.27191413
Br J Clin Psychol	2	0.089445438	0.089445438	22.36135957
Br J Dermatol	2	0.089445438	0.089445438	22.49552773
Br J Haematol	2	0.089445438	0.089445438	23.38998211
Br J Surg	2	0.089445438	0.089445438	24.10554562
Can J Anaesth	2	0.089445438	0.089445438	24.73166369
Can J Nurs Res	2	0.089445438	0.089445438	25
Cancer Epidemiol Biomarkers Prev	2	0.089445438	0.089445438	25.89445438
Cephalalgia	2	0.089445438	0.089445438	26.56529517
Child Care Health Dev	2	0.089445438	0.089445438	27.19141324
Chronic Illn	2	0.089445438	0.089445438	27.54919499
Clin Gastroenterol Hepatol	2	0.089445438	0.089445438	28.35420394
Clin J Am Soc Nephrol	2	0.089445438	0.089445438	28.75670841
Clin Rehabil	2	0.089445438	0.089445438	29.56171735
Contraception	2	0.089445438	0.089445438	33.09481216
Cyberpsychol Behav	2	0.089445438	0.089445438	34.48121646
Dement Geriatr Cogn Disord	2	0.089445438	0.089445438	34.70483005
Diabetes Metab	2	0.089445438	0.089445438	37.16457961
Diabetes Res Clin Pract	2	0.089445438	0.089445438	37.25402504
Diagn Microbiol Infect Dis	2	0.089445438	0.089445438	37.56708408
Dig Dis Sci	2	0.089445438	0.089445438	37.65652952

Table 1. Journals from the Population by Descending Frequency.

Dis Colon Rectum	2	0.089445438	0.089445438	37.74597496
Emerg Med J	2	0.089445438	0.089445438	38.95348837
Environ Health Perspect	2	0.089445438	0.089445438	39.08765653
Epilepsy Behav	2	0.089445438	0.089445438	39.31127013
Eur J Clin Nutr	2	0.089445438	0.089445438	40.02683363
Eur J Emerg Med	2	0.089445438	0.089445438	40.16100179
Eur J Endocrinol	2	0.089445438	0.089445438	40.25044723
Eur J Obstet Gynecol Reprod Biol	2	0.089445438	0.089445438	41.05545617
Eur J Oncol Nurs	2	0.089445438	0.089445438	41.14490161
Eur J Vasc Endovasc Surg	2	0.089445438	0.089445438	41.32379249
Eur Spine J	2	0.089445438	0.089445438	41.94991055
Gastroenterology	2	0.089445438	0.089445438	43.15742397
Gastrointest Endosc	2	0.089445438	0.089445438	43.24686941
Gesundheitswesen	2	0.089445438	0.089445438	44.27549195
Gut	2	0.089445438	0.089445438	44.36493739
Health Educ Behav	2	0.089445438	0.089445438	44.8568873
Health Educ Res	2	0.089445438	0.089445438	44.94633274
Heart Rhythm	2	0.089445438	0.089445438	47.6744186
Infect Control Hosp Epidemiol	2	0.089445438	0.089445438	48.43470483
Inform Prim Care	2	0.089445438	0.089445438	48.56887299
Inj Prev	2	0.089445438	0.089445438	48.65831843
Int J Health Care Qual Assur Inc Leadersh				
Health Serv	2	0.089445438	0.089445438	49.91055456
Int J Med Inform	2	0.089445438	0.089445438	50.04472272
Int J Obes Relat Metab Disord	2	0.089445438	0.089445438	50.44722719
Int J Psychiatry Med	2	0.089445438	0.089445438	50.67084079
Int Wound J	2	0.089445438	0.089445438	51.61001789
Intern Med J	2	0.089445438	0.089445438	51.83363148
J Affect Disord	2	0.089445438	0.089445438	52.95169946
J Aging Health	2	0.089445438	0.089445438	53.0411449
J Am Acad Nurse Pract	2	0.089445438	0.089445438	54.24865832
J Am Med Dir Assoc	2	0.089445438	0.089445438	56.17173524
J Am Med Inform Assoc	2	0.089445438	0.089445438	56.26118068
J Assoc Nurses AIDS Care	2	0.089445438	0.089445438	56.79785331
J Assoc Physicians India	2	0.089445438	0.089445438	56.88729875
J Behav Med	2	0.089445438	0.089445438	57.20035778
J Clin Gastroenterol	2	0.089445438	0.089445438	58.98926655

Table 1. Journals from the Population by Descending Frequency.

J Clin Psychopharmacol	2	0.089445438	0.089445438	61.09123435
J Dent Educ	2	0.089445438	0.089445438	62.03041145
J Emerg Med	2	0.089445438	0.089445438	62.16457961
J Epidemiol Community Health	2	0.089445438	0.089445438	62.34347048
J Geriatr Psychiatry Neurol	2	0.089445438	0.089445438	63.86404293
J Gerontol Nurs	2	0.089445438	0.089445438	64.13237925
J Hypertens	2	0.089445438	0.089445438	64.93738819
J Infect Dis	2	0.089445438	0.089445438	65.02683363
J Interv Card Electrophysiol	2	0.089445438	0.089445438	65.25044723
J Ment Health Policy Econ	2	0.089445438	0.089445438	66.05545617
J Midwifery Womens Health	2	0.089445438	0.089445438	66.14490161
J Nutr	2	0.089445438	0.089445438	67.5313059
J Obstet Gynecol Neonatal Nurs	2	0.089445438	0.089445438	67.62075134
J Occup Health	2	0.089445438	0.089445438	67.7549195
J Occup Rehabil	2	0.089445438	0.089445438	67.84436494
J Paediatr Child Health	2	0.089445438	0.089445438	68.15742397
J Pediatr Health Care	2	0.089445438	0.089445438	69.36493739
J Safety Res	2	0.089445438	0.089445438	71.19856887
J Stud Alcohol	2	0.089445438	0.089445438	71.77996422
J Thromb Thrombolysis	2	0.089445438	0.089445438	72.45080501
J Trauma Nurs	2	0.089445438	0.089445438	72.54025045
J Urban Health	2	0.089445438	0.089445438	72.8980322
Man Ther	2	0.089445438	0.089445438	75.62611807
Med Eng Phys	2	0.089445438	0.089445438	77.19141324
Methods Inf Med	2	0.089445438	0.089445438	77.68336315
Milbank Q	2	0.089445438	0.089445438	77.81753131
Mov Disord	2	0.089445438	0.089445438	78.0411449
Nurs Times	2	0.089445438	0.089445438	79.78533095
Nurse Educ Today	2	0.089445438	0.089445438	79.91949911
Obes Rev	2	0.089445438	0.089445438	80.23255814
Occup Environ Med	2	0.089445438	0.089445438	81.03756708
Ophthalmology	2	0.089445438	0.089445438	81.75313059
Ostomy Wound Manage	2	0.089445438	0.089445438	82.15563506
Paediatr Nurs	2	0.089445438	0.089445438	82.42397138
Pediatr Crit Care Med	2	0.089445438	0.089445438	85.55456172
Prev Cardiol	2	0.089445438	0.089445438	88.68515206
Prog Transplant	2	0.089445438	0.089445438	89.62432916

Table 1. Journals from the Population by Descending Frequency.

Psychiatr Q	2	0.089445438	0.089445438	89.75849732
Psychol Rep	2	0.089445438	0.089445438	91.41323792
Psychoneuroendocrinology	2	0.089445438	0.089445438	91.50268336
Psychosomatics	2	0.089445438	0.089445438	92.08407871
Rehabil Nurs	2	0.089445438	0.089445438	93.24686941
Resuscitation	2	0.089445438	0.089445438	94.14132379
S Afr Med J	2	0.089445438	0.089445438	94.76744186
Scand J Caring Sci	2	0.089445438	0.089445438	94.8568873
Scand J Public Health	2	0.089445438	0.089445438	95.16994633
Scand J Urol Nephrol	2	0.089445438	0.089445438	95.25939177
Spinal Cord	2	0.089445438	0.089445438	96.60107335
Taehan Kanho Hakhoe Chi	2	0.089445438	0.089445438	98.07692308
West J Nurs Res	2	0.089445438	0.089445438	99.59749553
Womens Health Issues	2	0.089445438	0.089445438	99.73166369
Worldviews Evid Based Nurs	2	0.089445438	0.089445438	99.86583184
Wound Repair Regen	2	0.089445438	0.089445438	99.95527728
AIDS Behav	3	0.134168157	0.134168157	2.191413238
Am J Emerg Med	3	0.134168157	0.134168157	4.561717352
Am J Gastroenterol	3	0.134168157	0.134168157	4.740608229
Am J Geriatr Psychiatry	3	0.134168157	0.134168157	5.008944544
Am J Health Syst Pharm	3	0.134168157	0.134168157	5.23255814
Am J Med Qual	3	0.134168157	0.134168157	7.200357782
Am J Respir Crit Care Med	3	0.134168157	0.134168157	8.363148479
AMIA Annu Symp Proc	3	0.134168157	0.134168157	8.720930233
Anesth Analg	3	0.134168157	0.134168157	9.212880143
Ann Rheum Dis	3	0.134168157	0.134168157	11.62790698
Ann Surg	3	0.134168157	0.134168157	11.76207513
Arch Dis Child Fetal Neonatal Ed	3	0.134168157	0.134168157	12.25402504
Aust J Adv Nurs	3	0.134168157	0.134168157	15.20572451
Aust N Z J Obstet Gynaecol	3	0.134168157	0.134168157	15.51878354
BJU Int	3	0.134168157	0.134168157	16.77101968
BMC Med Inform Decis Mak	3	0.134168157	0.134168157	18.6940966
Can J Cardiol	3	0.134168157	0.134168157	24.86583184
Cancer Causes Control	3	0.134168157	0.134168157	25.80500894
Cancer Nurs	3	0.134168157	0.134168157	26.07334526
Card Electrophysiol Rev	3	0.134168157	0.134168157	26.20751342
Clin Exp Allergy	3	0.134168157	0.134168157	28.2647585

Table 1. Journals from the Population by Descending Frequency.

Clin Invest Med	3	0.134168157	0.134168157	28.66726297
Clin Nurs Res	3	0.134168157	0.134168157	29.33810376
Clin Orthop Relat Res	3	0.134168157	0.134168157	29.47227191
Database Syst Rev	3	0.134168157	0.134168157	34.61538462
Epilepsia	3	0.134168157	0.134168157	39.22182469
Ergonomics	3	0.134168157	0.134168157	39.44543828
Eur J Cardiovasc Prev Rehabil	3	0.134168157	0.134168157	39.93738819
Eur J Nucl Med Mol Imaging	3	0.134168157	0.134168157	40.96601073
Exp Clin Psychopharmacol	3	0.134168157	0.134168157	42.17352415
Health Policy	3	0.134168157	0.134168157	45.16994633
Heart	3	0.134168157	0.134168157	47.31663685
Home Health Care Serv Q	3	0.134168157	0.134168157	47.98747764
Int Arch Occup Environ Health	3	0.134168157	0.134168157	48.8372093
Int J Tuberc Lung Dis	3	0.134168157	0.134168157	51.38640429
Int Nurs Rev	3	0.134168157	0.134168157	51.52057245
J Am Acad Dermatol	3	0.134168157	0.134168157	54.15921288
J Clin Pharm Ther	3	0.134168157	0.134168157	60.77817531
J Contin Educ Health Prof	3	0.134168157	0.134168157	61.89624329
J Gerontol A Biol Sci Med Sci	3	0.134168157	0.134168157	63.99821109
J Hum Hypertens	3	0.134168157	0.134168157	64.80322004
J Manag Care Pharm	3	0.134168157	0.134168157	65.51878354
J Manipulative Physiol Ther	3	0.134168157	0.134168157	65.6529517
J Nurs Educ	3	0.134168157	0.134168157	66.94991055
J Nurs Manag	3	0.134168157	0.134168157	67.08407871
J Nurs Res	3	0.134168157	0.134168157	67.21824687
J Oral Maxillofac Surg	3	0.134168157	0.134168157	67.97853309
J Psychiatr Ment Health Nurs	3	0.134168157	0.134168157	70.03577818
J Psychosom Res	3	0.134168157	0.134168157	70.21466905
J Wound Ostomy Continence Nurs	3	0.134168157	0.134168157	73.47942755
Lancet Oncol	3	0.134168157	0.134168157	75.53667263
Neurosurgery	3	0.134168157	0.134168157	78.89087657
Neurourol Urodyn	3	0.134168157	0.134168157	79.02504472
Nurs Health Sci	3	0.134168157	0.134168157	79.29338104
Osteoporos Int	3	0.134168157	0.134168157	82.06618962
Pain Physician	3	0.134168157	0.134168157	83.58676208
Pediatr Blood Cancer	3	0.134168157	0.134168157	85.42039356
Pediatr Diabetes	3	0.134168157	0.134168157	85.73345259

Table 1. Journals from the Population by Descending Frequency.

Pharmacoepidemiol Drug Saf	3	0.134168157	0.134168157	87.65652952
Prev Sci	3	0.134168157	0.134168157	89.31127013
Public Health Nurs	3	0.134168157	0.134168157	92.26296959
Qual Life Res	3	0.134168157	0.134168157	92.5313059
Respirology	3	0.134168157	0.134168157	94.05187835
Scand J Gastroenterol	3	0.134168157	0.134168157	94.99105546
Schizophr Bull	3	0.134168157	0.134168157	95.43828265
Semin Oncol	3	0.134168157	0.134168157	95.75134168
Soc Psychiatry Psychiatr Epidemiol	3	0.134168157	0.134168157	96.15384615
Stat Med	3	0.134168157	0.134168157	97.27191413
Support Care Cancer	3	0.134168157	0.134168157	97.85330948
Thorax	3	0.134168157	0.134168157	98.47942755
Am J Kidney Dis	4	0.178890877	0.178890877	5.635062612
Am J Obstet Gynecol	4	0.178890877	0.178890877	7.558139535
Am J Psychiatry	4	0.178890877	0.178890877	8.050089445
Am J Public Health	4	0.178890877	0.178890877	8.228980322
Anaesthesia	4	0.178890877	0.178890877	9.078711986
Aust Fam Physician	4	0.178890877	0.178890877	15.02683363
BMC Med Res Methodol	4	0.178890877	0.178890877	18.87298748
Br J Nurs	4	0.178890877	0.178890877	23.56887299
Br J Sports Med	4	0.178890877	0.178890877	24.01610018
Care Manag J	4	0.178890877	0.178890877	26.47584973
Clin Infect Dis	4	0.178890877	0.178890877	28.53309481
Control Clin Trials	4	0.178890877	0.178890877	33.31842576
Headache	4	0.178890877	0.178890877	44.6332737
Health Qual Life Outcomes	4	0.178890877	0.178890877	45.66189624
Home Healthc Nurse	4	0.178890877	0.178890877	48.16636852
Int J Clin Pract	4	0.178890877	0.178890877	49.32915921
Int J Nurs Stud	4	0.178890877	0.178890877	50.26833631
Int J Qual Health Care	4	0.178890877	0.178890877	50.89445438
J Acquir Immune Defic Syndr	4	0.178890877	0.178890877	52.14669052
J Adolesc Health	4	0.178890877	0.178890877	52.3255814
J Am Coll Surg	4	0.178890877	0.178890877	55.00894454
J Am Diet Assoc	4	0.178890877	0.178890877	55.23255814
J Am Soc Nephrol	4	0.178890877	0.178890877	56.57423971
J Cardiopulm Rehabil	4	0.178890877	0.178890877	58.1842576
J Clin Epidemiol	4	0.178890877	0.178890877	58.89982111

Table 1. Journals from the Population by Descending Frequency.

J Health Popul Nutr	4	0.178890877	0.178890877	64.44543828
J Med Internet Res	4	0.178890877	0.178890877	65.92128801
J Neurol Neurosurg Psychiatry	4	0.178890877	0.178890877	66.54740608
J Nurs Scholarsh	4	0.178890877	0.178890877	67.39713775
J Pediatr	4	0.178890877	0.178890877	69.27549195
J Rural Health	4	0.178890877	0.178890877	71.10912343
J Stud Alcohol Suppl	4	0.178890877	0.178890877	71.9588551
Med J Aust	4	0.178890877	0.178890877	77.41502683
Neurology	4	0.178890877	0.178890877	78.71198569
Obes Res	4	0.178890877	0.178890877	80.1431127
Pediatr Pulmonol	4	0.178890877	0.178890877	86.04651163
Prev Chronic Dis	4	0.178890877	0.178890877	88.86404293
Sex Transm Infect	4	0.178890877	0.178890877	95.97495528
Telemed J E Health	4	0.178890877	0.178890877	98.30053667
Urology	4	0.178890877	0.178890877	99.19499106
Addict Behav	5	0.223613596	0.223613596	1.118067979
Aliment Pharmacol Ther	5	0.223613596	0.223613596	2.817531306
Ann Pharmacother	5	0.223613596	0.223613596	11.49373882
Br J Psychiatry	5	0.223613596	0.223613596	23.79248658
Bull World Health Organ	5	0.223613596	0.223613596	24.55277281
Chron Respir Dis	5	0.223613596	0.223613596	27.45974955
Clin Ther	5	0.223613596	0.223613596	29.78533095
Crit Care Med	5	0.223613596	0.223613596	33.58676208
Diabetes Technol Ther	5	0.223613596	0.223613596	37.47763864
Drug Alcohol Depend	5	0.223613596	0.223613596	38.3273703
Drugs	5	0.223613596	0.223613596	38.59570662
Ethn Dis	5	0.223613596	0.223613596	39.66905188
Heart Lung	5	0.223613596	0.223613596	47.58497317
Int J Gynaecol Obstet	5	0.223613596	0.223613596	49.7763864
J Am Coll Cardiol	5	0.223613596	0.223613596	54.78533095
J Asthma	5	0.223613596	0.223613596	57.11091234
J Clin Psychiatry	5	0.223613596	0.223613596	61.00178891
J Palliat Med	5	0.223613596	0.223613596	69.09660107
J Sch Health	5	0.223613596	0.223613596	71.42218247
J Trop Pediatr	5	0.223613596	0.223613596	72.80858676
J Wound Care	5	0.223613596	0.223613596	73.34525939
Med	5	0.223613596	0.223613596	75.89445438

Table 1. Journals from the Population by Descending Frequency.

N Engl J Med	5	0.223613596	0.223613596	78.35420394
Pain Manag Nurs	5	0.223613596	0.223613596	83.22898032
Pain Med	5	0.223613596	0.223613596	83.45259392
Pharmacotherapy	5	0.223613596	0.223613596	87.92486583
PLoS Med	5	0.223613596	0.223613596	88.5509839
Psychooncology	5	0.223613596	0.223613596	91.72629696
Psychosom Med	5	0.223613596	0.223613596	91.99463327
Value Health	5	0.223613596	0.223613596	99.41860465
Age Ageing	6	0.268336315	0.268336315	1.878354204
Ann Behav Med	6	0.268336315	0.268336315	10.19677996
Clin Trials	6	0.268336315	0.268336315	30.05366726
Health Psychol	6	0.268336315	0.268336315	45.48300537
J Allergy Clin Immunol	6	0.268336315	0.268336315	53.30948122
J Am Board Fam Med	6	0.268336315	0.268336315	54.51699463
J Bone Joint Surg Am	6	0.268336315	0.268336315	57.51341682
J Cardiovasc Nurs	6	0.268336315	0.268336315	58.45259392
J Perinatol	6	0.268336315	0.268336315	69.81216458
Pharmacoeconomics	6	0.268336315	0.268336315	87.52236136
Phys Ther	6	0.268336315	0.268336315	88.23792487
Radiother Oncol	6	0.268336315	0.268336315	93.15742397
Res Nurs Health	6	0.268336315	0.268336315	93.55992844
Respir Med	6	0.268336315	0.268336315	93.82826476
Trop Med Int Health	6	0.268336315	0.268336315	98.97137746
Acad Emerg Med	7	0.313059034	0.313059034	0.402504472
Anesthesiology	7	0.313059034	0.313059034	9.525939177
Ann Allergy Asthma Immunol	7	0.313059034	0.313059034	9.928443649
BMC Cardiovasc Disord	7	0.313059034	0.313059034	17.08407871
Circulation	7	0.313059034	0.313059034	27.90697674
Clin J Pain	7	0.313059034	0.313059034	29.06976744
CMAJ	7	0.313059034	0.313059034	30.3667263
Dis Manag	7	0.313059034	0.313059034	38.05903399
Int J Technol Assess Health Care	7	0.313059034	0.313059034	51.25223614
J Eval Clin Pract	7	0.313059034	0.313059034	62.74597496
J Telemed Telecare	7	0.313059034	0.313059034	72.36135957
Nurs Res	7	0.313059034	0.313059034	79.65116279
Obesity (Silver Spring)	7	0.313059034	0.313059034	80.54561717
Prev Med	7	0.313059034	0.313059034	89.17710197

Table 1. Journals from the Population by Descending Frequency.

Qual Saf Health Care	7	0.313059034	0.313059034	92.88908766
Soc Sci Med	7	0.313059034	0.313059034	96.46690519
Addiction	8	0.357781753	0.357781753	1.475849732
Br J Cancer	8	0.357781753	0.357781753	22.18246869
Gerontologist	8	0.357781753	0.357781753	44.18604651
J Altern Complement Med	8	0.357781753	0.357781753	53.66726297
J Am Acad Child Adolesc Psychiatry	8	0.357781753	0.357781753	54.02504472
J Card Fail	8	0.357781753	0.357781753	57.91592129
Obstet Gynecol	8	0.357781753	0.357781753	80.90339893
Rheumatology (Oxford)	8	0.357781753	0.357781753	94.6332737
Stroke	8	0.357781753	0.357781753	97.6744186
Am J Cardiol	9	0.402504472	0.402504472	4.069767442
Psychol Med	9	0.402504472	0.402504472	91.32379249
Ann Fam Med	10	0.447227191	0.447227191	10.73345259
Arch Gen Psychiatry	10	0.447227191	0.447227191	12.70125224
Arch Pediatr Adolesc Med	10	0.447227191	0.447227191	13.99821109
BMC Public Health	10	0.447227191	0.447227191	20.12522361
Cancer	10	0.447227191	0.447227191	25.67084079
Eur J Heart Fail	10	0.447227191	0.447227191	40.83184258
Med Decis Making	10	0.447227191	0.447227191	77.05724508
Spine	10	0.447227191	0.447227191	97.04830054
Ann Intern Med	11	0.491949911	0.491949911	11.2254025
BJOG	11	0.491949911	0.491949911	16.63685152
BMC Fam Pract	11	0.491949911	0.491949911	17.57602862
Chest	11	0.491949911	0.491949911	27.05724508
Curr Med Res Opin	11	0.491949911	0.491949911	34.25760286
Diabetes Educ	11	0.491949911	0.491949911	37.07513417
Eur Respir J	11	0.491949911	0.491949911	41.86046512
Lancet	11	0.491949911	0.491949911	75.31305903
Oncol Nurs Forum	11	0.491949911	0.491949911	81.57423971
Am Heart J	12	0.53667263	0.53667263	3.533094812
Gen Hosp Psychiatry	12	0.53667263	0.53667263	43.78354204
J Adv Nurs	12	0.53667263	0.53667263	52.86225403
J Rheumatol	12	0.53667263	0.53667263	70.88550984
Pain	12	0.53667263	0.53667263	83.00536673
Am J Med	14	0.626118068	0.626118068	7.066189624
Arthritis Rheum	14	0.626118068	0.626118068	14.75849732

Table 1. Journals from the Population by Descending Frequency.

BMC Musculoskelet Disord	14	0.626118068	0.626118068	19.49910555
Contemp Clin Trials	14	0.626118068	0.626118068	32.96064401
J Consult Clin Psychol	14	0.626118068	0.626118068	61.76207513
J Pain Symptom Manage	14	0.626118068	0.626118068	68.82826476
Diabet Med	15	0.670840787	0.670840787	35.42039356
Fam Pract	15	0.670840787	0.670840787	43.02325581
Health Serv Res	15	0.670840787	0.670840787	46.33273703
Med Care	15	0.670840787	0.670840787	76.56529517
Arch Intern Med	17	0.760286225	0.760286225	13.46153846
J Clin Nurs	17	0.760286225	0.760286225	59.83899821
J Clin Oncol	17	0.760286225	0.760286225	60.59928444
Am J Manag Care	18	0.805008945	0.805008945	6.440071556
Br J Gen Pract	18	0.805008945	0.805008945	23.30053667
Health Technol Assess	18	0.805008945	0.805008945	47.18246869
J Gen Intern Med	18	0.805008945	0.805008945	63.72987478
BMC Health Serv Res	19	0.849731664	0.849731664	18.51520572
J Am Geriatr Soc	19	0.849731664	0.849731664	56.0822898
Pediatrics	23	1.02862254	1.02862254	87.07513417
JAMA	24	1.073345259	1.073345259	74.55277281
Psychiatr Serv	25	1.118067979	1.118067979	90.92128801
Diabetes Care	26	1.162790698	1.162790698	36.58318426
BMJ	37	1.654740608	1.654740608	21.77996422
Cochrane Database Syst Rev	37	1.654740608	1.654740608	32.11091234
Patient Educ Couns	37	1.654740608	1.654740608	85.2862254
Total	2236	100	100	

Table 2. Citations by Category.

Citation Category	Number of Cites	Number of Journals	%	Times 100	Divided by 2.68, Rounded
OneCite	387	387	17.31%	17.30769231	6
TwoCite	284	142	12.70%	12.70125224	5
ThreeCit	210	70	9.39%	9.39177102	4
FourCite	160	40	7.16%	7.155635063	3
FiveCite	150	30	6.71%	6.708407871	3
SixCite	90	15	4.03%	4.025044723	2
Seven	112	16	5.01%	5.008944544	2
EightCit	72	9	3.22%	3.220035778	1
NineCite	18	2	0.81%	0.805008945	0
TenCite	80	8	3.58%	3.577817531	1
Eleven	99	9	4.43%	4.427549195	2
TwelveCi	60	5	2.68%	2.683363148	1
TwlvPlus	514	26	22.99%	22.98747764	9
Total			1		39

Table 2 gives the number of citations in each citation category, the number of journals found in each category, and the percent each category represents of the total population. The last two columns show the math used to determine the number of citations needed to be selected from each category to be reasonably representative of the total population.

Table 3. Visual Representation of Each Category as a Percent of the Population.

