

## Perspectives on the use of routine health information for research, policy and practice

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### ABSTRACT

Administrative data or routine health information refers to data produced by administrative agencies at intervals of one year or less to meet predictable information needs. This paper aims to present a researcher's perspective on the challenges and potential of administrative data in the area of health services research and policy, drawing on lessons learned from six research projects implemented in the past decade. These advantages and challenges are broadly categorized according to the dimensions of availability, access and analysis. Action areas or points for consideration are offered to various stakeholders involved with administrative data use for health research to address concerns identified.

*Keywords:* administrative data, health information systems, health services research, data collection, data analysis

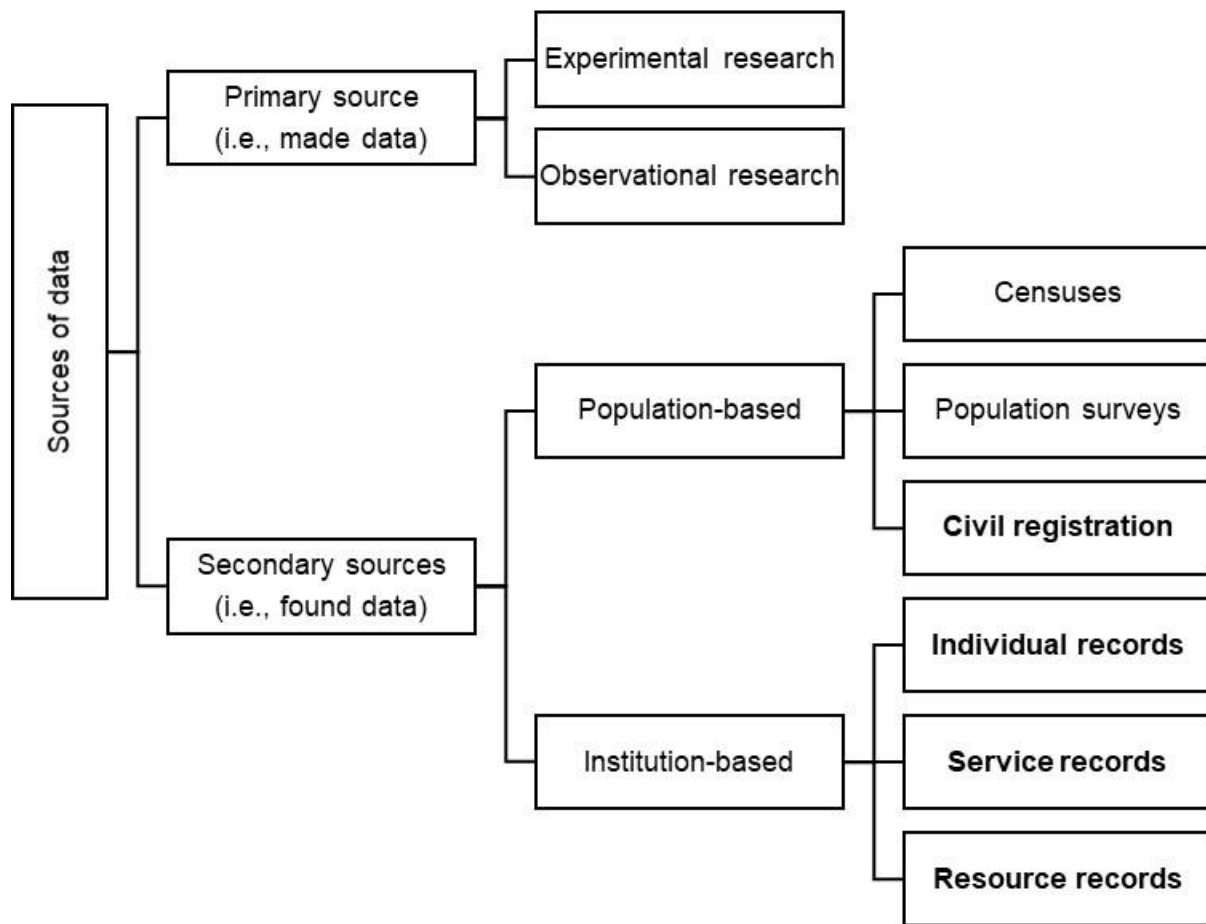
### 1. Introduction

Secondary sources of data present a very attractive alternative when conducting research not in the least because of the relative efficiency of this approach especially when seen from the lens of resource constraints and limits. *Administrative data* comprise one such source, which is closely related, but not entirely equivalent, to the term *routine health information* used in the health sector (the latter is usually taken to be institution-based data; see Health Metrics Network and World Health Organization (2008)).

For purposes of the present paper, these two terms will be used interchangeably and will be defined as *data produced by administrative agencies at intervals of one year or less to meet predictable information needs (i.e., registration, transaction, record-keeping)* (Elias, 2014; Hotchkiss, Diana, & Foreit, 2012; Woollard, 2014). From a health sector perspective, this data can be obtained from civil register (a population-based source), and records maintained by institutions such as individual records (e.g., patient chart, medical record), service records (e.g., target client lists of the Field Health Service Information System), and resource records (e.g., inventory of medicines and vaccines) (Connelly, Playford, Gayle, & Dibben, 2016; Health Metrics Network & World Health Organization, 2008). Figure 1 depicts a schematic differentiating primary (or made) and secondary (or found) data and highlights the sources of administrative data or routine health information.

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**Figure 1. Sources of research data.** Administrative data can be obtained from civil registries (a population-based source), and records maintained by institutions (Connelly et al., 2016; Health Metrics Network & World Health Organization, 2008).

This paper aims to present a researcher’s perspective on the challenges and potential of use of administrative data in the area of health services research and policy, drawing on lessons learned from six research projects implemented in the past decade (Table 1). At the outset, it must be emphasized that this discussion is not meant to be an exhaustive and definitive account on the use of routine health information for research purposes, as this has been accomplished by other scholars previously (Connelly et al., 2016; Gavriellov-Yusim & Friger, 2014; Mazzali & Duca, 2015; Woollard, 2014). Nonetheless, this manuscript will have fulfilled its purpose if it can serve as the impetus for further and more rigorous scholarship on this topic in the local setting.

**Table 1. Author's published work using administrative health data**

Reference	Aim	Source of administrative data
<b>Monitoring of health services</b>		
Antonio (2014a)	Describe the outcomes of a public-private mix DOTS strategy for TB prevention and control implemented in a highly-urbanized city	Reports on case-finding and case-holding activities maintained by a highly-urbanized city, 2006-2013
Antonio (2014b)	Determine outcome of quality improvement intervention implemented in a community health center in a highly-urbanized city	Daily service record maintained by the community health center, Aug-Dec 2012
<b>Program/project evaluation</b>		
Antonio and Hilario (2013)	Document outcomes of a supplemental immunization activity implemented in Pasay City	Daily and weekly immunization service reports submitted by participating health facilities, Nov 2010 to May 2011
Cochon et al. (2019)	Assess the effectiveness of a national project on pharmacist engagement in the prevention, detection, and management of TB in the community	Reports on case-finding activities maintained by the TB prevention and control programs in five project implementation sites, 2011-2016
<b>Academic research</b>		
Antonio and Consunji (2011)	Quantify the magnitude of drowning injury related deaths among children in the Philippines	Database maintained by the (then) National Epidemiology Center, 1996-2003
Vista et al. (2016)	Determine the proportion of patients enrolled in a TB DOTS program who experienced delay in the initiation of their treatment, as well as the duration of the delay in the initiation of treatment	Tuberculosis patient registry maintained by health centers in a highly-urbanized city, 2014

NOTES: DOTS – Directly Observed Treatment Short-course; TB - Tuberculosis

## 2. Perspective on the use of administrative data

The advantages and challenges on the use of administrative data for research and policy can be broadly categorized according to the dimensions of availability, access and analysis (Table 2).

**Table 2. Advantages and challenges on the use of administrative data**

	Advantage	Challenge
<b>Availability</b>	Large sample with serial measurements of real-world data	Subject to information and selection bias
<b>Access</b>	Relatively efficient and unobtrusive when compared with primary data collection	Restrictions imposed by legal, regulatory, administrative and ethical policies/guidelines

<b>Analysis</b>	Resulting data similar to variable by case matrix from surveys	Use of statistical significance and its interpretation
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*Availability.* In the health sector, administrative data offers researchers the possibility of working with a large sample of real-world data measured continuously, or serially, over many time points. For example, records maintained by community health centers capture data on the implementation across the country of the Expanded Program on Immunization since its inception in the late 1970s. Because of this coverage, a researcher interested in studying immunization practices can account not only for demographic variables but also temporal and spatial considerations. In a research to measure delay in initiation of treatment for tuberculosis, Vista et al. (2016) were able to examine the data for 420 individuals enrolled in the treatment program of one locality for the 2014 calendar year.

Scholars, however, should be cognizant that there will be inherent selection and information bias in administrative data since it was collected for an entirely different purpose. First, while researchers may be able to retrieve data for all individuals listed in a register, it is highly possible that such source will not capture the entire universe, nor can it be considered as being truly representative of the population of interest. This is principally because certain facilities and services offered by public institutions, which are the primary generators of administrative data, tend to attract specific population segments. Prior research, for instance, showed that two private hospitals were able to contribute about 5% to the total number of tuberculosis cases registered in one locality; a higher additionality may be expected if other private clinics are included (Antonio, 2014a).

Information bias, on the other hand, may result from incomplete or misclassified data, or revisions in the type and definition of certain data points collected that are not known to the researcher. This was encountered in an evaluation of a new tuberculosis control intervention, where data on tuberculosis cases detected for certain years during the evaluation period were found to be unavailable (Cochon et al., 2019). In the same project, the team had to be cautious in deriving data from health facilities since the case definition used by the National Tuberculosis Prevention and Control Program was revised beginning 2014 (Department of Health, 2013), whereas our period of interest was from 2011 to 2016.

*Access.* Compared to primary sources, the use of administrative data presents a relatively efficient and unobtrusive alternative when conducting health research. Data is readily available and can be requested from health facilities, or even higher administrative offices which collate institution-based data (e.g., Epidemiological and Surveillance Units in cities, provinces, or regions), which means researchers will not need to allocate as much human, material, and financial resources as when a large-scale survey is conducted, nor will individual respondents/participants need to be bothered to participate in a study. This feature of administrative data permitted the analysis of the trend of child drowning injury in the Philippines over a 40-year period (Antonio & Consunji, 2011).

Researchers, however, will need to surmount restrictions imposed by legal, regulatory, administrative and ethical policies/guidelines prior to gaining access to administrative data. The current legal regime in the Philippine permits secondary use of data for research purposes provided, among others, that the concerned individual has consented to such processing (Congress of the Philippines, 2012; National Privacy Commission, 2016). This provision may prove to be a gray area for research that intends to examine administrative data collected prior to the promulgation of the law in 2012, during which time formal consent for data collection in public health facilities was not a routine practice.

Further, institutions differ in their policies on who, how, and in what form administrative data under their custody can be accessed, and some do not even have any such policy. Use of administrative data for the studies reported by Antonio and Hilario (2013), and Antonio (2014b), for instance, was facilitated by the fact that the analysis was carried out by individuals who were known to the organization keeping the data.

*Analysis.* Finally, as was noted in the literature, analysis of administrative data typically follows that used for other studies since the resulting data is similar to variable by case matrix in which variables are encoded in columns, while rows represent individual observations (Connelly et al., 2016; Mazzali & Duca, 2015). Hence, researchers can utilize existing techniques in the statistical armamentarium for purposes of analysis.

One drawback to administrative data analysis, however, especially when a large data set is used, is the concomitant higher tendency to find (or the temptation to search for) statistically significant findings.

### 3. Way forward and concluding thoughts

Given the challenges identified in the preceding section, a few action areas or points for consideration are offered to various stakeholders involved with administrative data use for health research (Table 3). Readers may also want to review commendations in the published literature (Connelly et al., 2016; Gavriellov-Yusim & Friger, 2014; Mazzali & Duca, 2015).

**Table 3. Action areas on use of administrative data for research**

	<b>Researcher</b>	<b>Institutions</b>	<b>System</b>
<b>Availability</b>	Assess data quality prior to use  Describe administrative data and source in methods section	Strengthen data quality by engendering information culture among stakeholders (i.e., those who generate and use administrative data)	
<b>Access</b>	Factor in longer time for access, appraisal, and analysis of administrative data	Develop internal protocols on how to handle requests for access to, and re-use of, administrative data	Institutionalize a policy on access to, and re-use of, administrative data from government agencies
<b>Analysis</b>	Undertake analysis with explicit theoretical base/framework	Build skills of researchers and institutions in management and analysis of data derived from administrative sources	

Researchers are encouraged to gain familiarity with their data source, incorporate data quality assessment in their study procedures, and disclose sufficient background information on the source of administrative data in their research report. The onus is on the researcher to show, for example, that they have a clear understanding of the definition of variables (and the corresponding categories) used in a particular administrative data repository, as well as any changes made to it over time. As a corollary of the preceding recommendation, as well as clearing the administrative procedures related to access, researchers should consider possibly longer time to be spent in the access, appraisal, and analysis of administrative data. Finally, analysis of data should be undertaken with a clear theoretical underpinning (Frohlich et al., 2007), or correlation with clinical or public health significance, to avoid reporting on spurious associations one may

encounter. These point to a need to build the skill of researchers and research institutions in the management and analysis of data derived from administrative sources.

Biases inherent in administrative data can be partly addressed by improving data quality at the point of generation, aggregation and primary use. This means strengthening the technical, organizational, and behavioral determinants of health information systems, and engendering information culture among those who produce and use administrative data (Aqil, Lippeveld, & Hozumi, 2009; Hotchkiss et al., 2012).

Looking at the issue further upstream, organizations and facilities hosting administrative data will need to develop policies and protocols on how to handle requests for access to, and re-use of, administrative data, and ensure that these are made publicly available. This will serve as advance information that researchers can consider when designing their research project and deciding on timeline and resource allocation. Since most administrative data is collected by public agencies and institutions, policies and guidance of a broader scope may also need to be formulated. Models from other jurisdictions can serve as starting point for the development of these policies (Burgun et al., 2017; Martin, Helbig, & Shah, 2014; Pavis & D Morris, 2017). The main purpose of these policies, however, should be to balance the interest of researchers with that of two other stakeholders: the institution, mandated by law to act as data custodian (Congress of the Philippines, 2012; National Privacy Commission, 2016), and the individuals and wider public who are the subject of such administrative data (Paprica & Michael, 2017).

In summary, this paper argued that administrative data presents a valuable resource for studying health issues. Researchers, however, should exercise prudence in the use of administrative data. Data quality and access concerns require action at the institutional and system levels.

### **Acknowledgement**

An earlier version of this manuscript was reviewed by Ms. Kim L. Cochon (PhD student, Department of Statistics, The Chinese University of Hong Kong) and Dr. Amiel Nazer C. Bermudez (Assistant Professor, Department of Epidemiology and Biostatistics, College of Public Health, University of the Philippines Manila; Doctoral Student, PhD in Epidemiology Program, Department of Epidemiology, School of Public Health, Brown University).

### **Disclaimer**

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