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A Model of Deinstitutionalization of Psychiatric Care across 161 Nations: 2001–2014

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Abstract: Deinstitutionalization has been ongoing since the 1950s and is a trend that has been molded by diverse sociocultural conditions and competing ideologies. Key questions from the literature include its extent and the drivers motivating it, political and financial dimensions, and consequences in such domains as homelessness, nursing home care, and the criminalization of the mentally ill. This study specifically addresses questions about the extent of deinstitutionalization internationally, and the salience of competing explanations of this trend for understanding the extent of availability of psychiatric beds.

This study employs a secondary analysis of data from the four editions of the World Health Organization's *Mental Health Atlas*, as well as supplemental international databases. It uses a regression methodology to examine rates of change of psychiatric beds during 2001–2014 in 161 nations. Predictors include key geographic, demographic, socioeconomic, political, cultural, and service system conditions.

The study reveals deinstitutionalization of inpatient care is far from universal, characterizing almost a half (45.1%) of the world's nations. That the overall decline in inpatient beds is close to half of one percent (–0.41%) per year indicates this is a modest reduction, notwithstanding dramatic changes in both directions in subsets of nations. The regression model accounts for 55.7% of the variation of deinstitutionalization, using several significant predictors. Deinstitutionalization is associated with income inequality, racial and ethnic diversity, low population density, a high Human Development Index, psychiatric commitment laws, high incarceration rates, among other conditions.

Keywords deinstitutionalization; psychiatric hospitalization; geography of mental health; community mental health

The deinstitutionalization of psychiatric beds reflects a long-term and pervasive restructuring of mental health service systems, both local and national. It is a term that has been used to refer to various phenomena, ranging from the depopulation of public psychiatric hospitals to changes that include the development of community mental health services [1]. In the United States, it is a trend that began in 1955, but in many nations it did not emerge until the 1990s or later.

Given the long history and ideological debates surrounding deinstitutionalization, it should be noted that research on this trend has rarely advanced beyond the use of uncontrolled descriptive statistics, case studies, and other descriptive methodologies. And it has only been since the 1990s that this trend has been examined in an international context. Much of this work has been

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noncumulative, addressing questions that range from the causes and drivers of deinstitutionalization, to its political dynamics and financial dimensions, and its consequences in such areas as homelessness, nursing home care, and the criminalization of the mentally ill.

The purpose of this article is not to present a comprehensive review of the considerable literature on deinstitutionalization, since there are already many excellent reviews [2–6]. Instead, it aims to describe this trend on an international scale and explore potential predictors of levels of deinstitutionalization of psychiatric care across the world during the 2001–2014 period. Whereas its detractors often argue that financial savings has been a central motivation [5], advocates emphasize the ideal of improving community care and assuring the human rights of psychiatric patients [7]. Commentators have proposed a variety of theories about the drivers of this trend, which typically include some combination of historical, geographic, cultural, socioeconomic, political, and service system explanations. Most hypothesize that there is a complex combination of drivers, applicable differentially in varying contexts. Thus, this study aims to develop an exploratory and descriptive model of conditions that are potentially explanatory of the extent of deinstitutionalization across all nations for which data is available. It does this through the use of existing data sources collected by the World Health Organization (WHO) [8–11] and other international organizations. This study also examines the question about the extent to which deinstitutionalization has continued to take place on a global scale during the initial years of the 21st Century (2001–2014).

BACKGROUND

The deinstitutionalization of psychiatric care has taken place primarily in the mental health systems of developed, usually westernized nations, ones that have experienced a preceding period involving the building of psychiatric hospitals. For instance, in the United States, a dramatic expansion in inpatient psychiatric beds took place between 1840 and 1955, from 1 per 100,000 population to 338.9 per 100,000 (calculated from [12]).

The trajectories of deinstitutionalization have varied dramatically, depending not only on the nation or state considered, but also the type of data examined. Unlike in the United States, in many parts of the world deinstitutionalization did not begin until the 1970s, ranging into the 1990s or later. In the United States, as a whole, if we consider the number of annual psychiatric hospital episodes, the population rate of those in public institutions in the United States declined by 96% between 1950 and 2010, to the same level as 1850 [13–15]. Nonetheless, reports indicate that in many parts of the world, the mental health systems are still dominated by inpatient care. A study of 42 low- and middle-income nations, that employed the *World Mental Health Atlas* data, found that 80% of mental health resources continue to be devoted to inpatient care and little to community mental health [16]. Despite the recent availability of data relevant to deinstitutionalization from WHO sources, the extent of the phenomenon on a worldwide basis has not yet been systematically analyzed and reviewed.

Theoretical Perspectives on Deinstitutionalization

Several explanations have been proposed for the contraction in availability of psychiatric beds, ones for which there is mixed support. In several nations, early drivers include the exorbitant

cost of maintaining antiquated hospital systems; the introduction of the first generation of psychotropic medications in the early 1950s; and a combination of journalistic exposés of horrible conditions in public psychiatric hospitals, along with the development of alternative service ideologies and approaches that emphasize short-term care in community settings.

Concurrent with these changes was the development of formal policies aimed at replacing institutional care with community mental health, such as the Community Mental Health Act introduced in the United States by President John F. Kennedy in 1963 [17]. Such changes were only associated with modest declines in institutional care in the 1955 to 1965 period. Some of the greatest declines, however, took place in the following decades, primarily during the 1965 to 1980 period [13]. Two of the most significant factors introduced during this period involved a new emphasis on civil rights, particularly, the protection of the civil and procedural rights of mental patients including the restriction of commitment criteria to the requirement that patients be dangerous to self or others before they could be involuntarily committed [18]. In addition, the introduction of a variety of financial incentives to support patients outside of the hospital is believed to have accelerated the discharge of mental patients to nursing homes, other community facilities, as well as acute units in general hospitals. In recent years, the introduction of increasingly stringent cost-containment controls, mainly in the private managed care insurance market, has also served to minimize length of stay, resulting in the decline of inpatient hospitalization in specialty psychiatric settings as well as in general hospitals [19].

Even as psychotropic medications and financial incentives are often cited, several other explanations have also been advanced for deinstitutionalization. Novella [8] includes some of these in his review, emphasizing the role of ideology, specifically the anti-psychiatry and related critiques of the conventional explanation that focuses on the introduction of psychotropic medications. He notes that several of these explanations, such as that of anti-psychiatry, professionalization, and decarceration [2], emphasize the changing power relationships between treaters (primarily psychiatrists) and their clients, and the change to a community context of care as a means of preserving social control relationships and professional hegemony. Novella [5] points out that such explanations minimize the role of changing cultural and socioeconomic conditions. Other explanations that Novella [5] reviews include the expansion of psychiatric rehabilitation, including transinstitutionalization in which costs are seemingly reduced by shifting care to community institutions such as shelters, nursing homes, and prisons. For example, several researchers [20, 21] have attempted to advance what has come to be known as the Penrose Hypothesis [22], either that the social controls inherent in psychiatric hospitalization are replaced with those of jails and prisons, leading to the criminalization of the mentally ill, or that social control is alternatively pursued either through inpatient mental health care or through prisons.

Although the relative salience of these accounts are debated, especially given their scarce empirical support, it is clear that some combination of the critique of large institutions, financial incentives, changing treatment ideologies, and especially a growing focus on the civil rights of patients have all driven the transition of patient care to community contexts, and that official policies, such as the Community Mental Health Act (1963) in the United States, may have played only a secondary role in highlighting and legitimizing such trends. Those who have pointed out the injustices of premature discharge of patients to the community have emphasized the extent that deinstitutionalization perpetuates and aggravates inequality. In contrast, others argue that inequality is minimized by supporting the reintegration of the seriously mentally ill back into their communities (see [23]).

National Studies of Deinstitutionalization

Very little systematic or comparable data is available on the extent of deinstitutionalization throughout the world. There are several scores of publications on the experience in particular nations and regions that have employed case studies, descriptive statistics, and other uncontrolled studies. In the United States, commentators include Lamb [20] and others who have highlighted the precipitousness of the process that the depopulation of state and county hospitals often occurred prior to the development of community services, and that too much emphasis has been placed on changing the locus, rather than on improving the quality of care. A pervasive theme in many nations has been the organizational fragmentation of care due to the split of responsibility for mental health between local and national authorities that has resulted in very uneven implementation of the policy.

In Europe, similar themes appear in the literature, especially the slowness in developing community mental health services [24]. Ireland, for instance, has been cited as a nation that started out with some of the highest institutionalization rates in the world, and has only slowly reduced its hospitalization levels, albeit in a geographically uneven manner [25]. In Germany, deinstitutionalization was also reported in some areas in name only, with the transfer of patients to renamed sections of hospitals [26]. Others have complained that in Scandinavia there has been limited cooperation among the competing responsible authorities [27]. One report from North Finland indicates that smaller and less wealthy counties have moved more quickly to deinstitutionalize, compared to larger counties that have been better able to afford ongoing hospitalization for those in need [28]. Italy, in contrast, has seen some of the most dramatic declines in psychiatric hospital care in Europe, led by the Psichiatria Democtratica movement inspired by Franco Basaglia that emphasized the "de-psychiatrization" of mental illness, the loosening of commitment criteria, and the attempt to liquidate all psychiatric hospitals [29]. Spain also is reported to have achieved major advances with deinstitutionalization, specifically, the development of new decentralized forms of community mental health care that are effectively integrated with general medical care, but not without some inequities in their geographic distribution [30].

In Australia and New Zealand, the progression of deinstitutionalization has been slow but steady, nonetheless, with complaints that the process has failed to be associated with systematic planning or adequate community support systems [31]. Inpatient care in these nations has been decidedly better than community mental health care [32].

In South America, it has only been in the last few decades that deinstitutionalization has started to be implemented [4]. Some of the greatest declines of public inpatient care are reported to have taken place in Uruguay and Paraguay, and to a lesser extent in Chile, Brazil, Columbia, Venezuela, and Peru [33]. In Brazil, these declines were reported to have been made possible by the development of acute inpatient units in private hospitals [34].

Parts of the world that have deinstitutionalized the least include Japan; East Asia in general; and also, until the late 1990s, Israel. Yip [35] reports that in Hong Kong care remains highly institutionalized, and likewise, Kuno and Asukai [36] contend that in Japan reductions in inpatient care are unlikely, given both cultural factors, as well as the low cost of hospitalization. In Israel, in 2000 new rehabilitation legislation was enacted that led to a dramatic shift in care to community services [37]. Exceptionally little data is published on the experience in Middle Eastern, African, and many of the developing nations, in part, because of the scarcity of comprehensive mental health systems.

International Mental Health Policy Research[1]

It has only been in recent years that a body of empirical research has emerged in the larger field of international mental health policy, but only a small proportion of these studies have focused on deinstitutionalization. Editorials and commentaries have emphasized dramatic disparities between the mental health systems of developed and developing nations. Discussions of the sparsity of resources in the developing nations have repeatedly urged the need for better integration of mental health into the work of primary care practitioners [38], given the very low rates of mental health professionals in many developing nations. Similarly, improved public education has often been recommended, along with the more creative use of nonprofessional staff, and improved access to psychotropic drugs, all of which have been viewed as cost effective measures [39]. Finally, editorials regularly urge more consistent and rigorous collection of data on epidemiology, services, and outcomes [40].

Single and comparative national case studies date back many years, most notably to Kemp's compendium, *International Handbook of Mental Health Policy* [41]. Studies such as Lurie's [42] that compares the systems in the United Kingdom, United States, Canada, and New Zealand highlighted themes of recovery, stigma reduction, developing services for particular client populations. Increasingly, governments are not being expected to provide services, as much as to fund and regulate them. A recent comparison of the systems in Australia and China emphasized the need for developing nations not to rely exclusively on institutional services, and to emulate those nations, such as Australia, which have moved more aggressively toward the creation of community service systems [44]. Particular barriers, relevant to China, as well as to many developing nations, include the lack of professionals and services in rural areas, in part, due to problems inherent in the poor economies of scale associated with service development in such sparse environments.

Since the *World Development Report* [45], the *Global Burden of Disease Report* [46], and other international reports, the WHO has increased its research and advocacy efforts in mental health. These have included the publication of the *Mental Health Atlas* [8–11] dissemination of the WHO Assessment Instrument for Mental Health Systems (WHO-AIMS), and the launching of the Mental Health Gap Action Programme (mhGAP) [47] and the Movement for Global Mental Health in 2008.

Of particular relevance for the current study, the *World Mental Health Atlas* is a compendium of data garnered through a descriptive survey of the mental health systems in 192 countries, conducted most recently in 2014. Areas covered by the survey consist of questions on the presence of a (i) mental health policy; (ii) a national mental health program; (iii) mental health legislation; (iv) substance abuse policy; (v) availability of psychotropic drugs; (vi) the budget for any mental health program; (vii) methods for the financing of mental health services; (viii) mental health in primary care and training; (ix) service availability, particularly, psychiatric beds; (x) rates of mental health professionals; (xi) programs for special populations; and (xii) information gathering systems. Official reports of the results are limited to simple tabulations, such as those of frequencies and means. Substantial data is missing or unavailable, particularly for developing nations. Although data reported in the *World Mental Health Atlas* [48] reveal that four-fifths of the world's nations have mental health programs,

[1]Portions of this section are adapted from [43].

and seven-tenths (70%) have mental health legislation, with the most pronounced inequities involving budgets, services, and professionals. Unfortunately, it has been the exception that such inequities are considered in the context of underlying disparities in mental health conditions and needs. Yet, indicators of need are greater in Europe than in Africa, where the rate of neuropsychiatric conditions is 3,266 per 100,000 in Europe, compared with 2,538 per 100,000 for Africa. North America, including the United States, is closer to the European experience, but falling short of Europe in its mental health service coverage [43].

Since the initial dissemination of its *World Mental Health Atlas*, WHO has continued to refine its data collection instrument on national mental health systems, and this is now known as the Assessment Instrument for Mental Health Systems (WHO-AIMS 2.2). It covers the six domains included in the *Atlas* and is designed to facilitate cross-country comparisons. As much as this initiative represents an important advance in the study of national mental health systems, critics have emphasized the neglect of the political dimensions of mental health policy development, minimization of the role of culture in mental health care utilization, and questionable measurement validity [49].

The WHO *World Mental Health Atlas* initiative has succeeded in stimulating several other research efforts aimed at systematically understanding national mental health systems. Most notable has been the formation of the International Observatory on Mental Health Systems (IOMHS) at the University of Melbourne. The aim of this institute is to monitor the mental health systems in low and middle income countries, and to find some way "to rationally classify mental health systems at national and subnational (provincial and district) levels. Along these same lines, the Organization for Economic Cooperation and Development (OECD) has been developing a mental health monitoring systems for its 30 member states, one that looks not just at services, but at outcomes [50].

With the accumulation of new descriptive data through the *Atlas* and the WHO-AIMS instrument, the possibility of correlational, specifically, quasi-experimental research in this field has opened up. Although there have been a variety of correlational studies on the development of social welfare and social security systems throughout the world, this has not been the case with mental health due to the lack of data. One of the earliest studies of this type was that conducted by Pillay [51] who demonstrated a simple but strong 0.84 zero-order correlation between gross national product (GNP) and rates of mental hospitalization within nine of the OECD states. The study also shows no significant correlation between GNP and length of stay. Unfortunately, such zero-order bivariate correlations typically raise more questions than they answer, given the very small sample size and lack of statistical controls.

To date, the development of the *Mental Health Atlas* data has enabled several studies of variations in national mental health policies. *World Development Report 1993: Investing in Health* by the World Bank [45] utilized the second wave of this data (2006) to investigate whether there were one or multiple dimensions characteristics of the development of national mental health systems, as well as which environmental characteristics are most closely associated with such development. He found through a factor analysis that three orthogonal or uncorrelated dimensions were identified that are characteristic of the 138 nations: (i) General Mental Health Services (professionals and inpatient beds), (ii) Public Mental Health Program; and (iii) Community Mental Health that collectively accounted for 45% of the variance in the database of WHO predictors. Only one, General Mental Health Services, was substantially explained (Adj. $R^2 = 0.641$; $p = 0.001$) by the predictors, specifically, by Democratization, distance from

Paris, gross domestic product, and Inglehart's measure of self-expression (versus survival) values. None of these factors specifically assessed the level of deinstitutionalization, although the third (and weakest) factor tapped an important element of it (community mental health).

Shen and Snowden (2014) followed up on this study in 2014 to attempt to identify the key predictors of the history of deinstitutionalization, specifically, whether nations were early or late adopters, through a regression model of aggregated psychiatric hospitalization data from the first three waves of the *World Mental Health Atlas* study, those from 2001, 2006, and 2011. Unfortunately, despite their sophisticated theoretical review, their hypotheses involving predictors of early versus late adoption of deinstitutionalization remain untested due to the way that two key variables were operationalized. First, instead of modeling as their dependent variable, the rate or slope of decline in psychiatric hospitalization (deinstitutionalization), they instead modeled the absolute rate of psychiatric inpatient care in each of the nations. Unfortunately, bed rates by themselves cannot be taken as indicative of either absolute or relative declines in institutional care. Second, their measure of year of adoption of a policy of deinstitutionalization consisted of the adoption of a formal mental health policy. Even if adoption of a mental health policy could have been treated as a proxy for decisions to deinstitutionalize, in many nations, such as the United States, such formal decisions followed, rather than preceded the initiation of the trend toward deinstitutionalized care.

Summary and Research Questions

Despite the contributions of these initial regression studies, none of the foregoing studies address the underlying aim of the current study, namely, understanding the extent and drivers of the deinstitutionalization of psychiatric care on an international basis. In general, the results of prior research on both the extent of deinstitutionalization across nations and its drivers have been either nonexistent or noncumulative due to the diversity of definitions, methodologies, and measures used. This emerging body of research has had primarily a heuristic value that points to the plausibility of a variety of competing and complimentary explanations for the extent that deinstitutionalization has taken place. Several of these explanations involve economic resources and incentives, and general level of socioeconomic development, including the level of economic inequality. Likewise, several have involved culture, specifically, democratization. Closely related is the degree of tolerance for the mentally ill, their inclusion in the community, and confidence in the possibilities of their treatment. The introduction of or access to psychotropic medications, as well as new approaches to psychosocial and rehabilitative treatment, have also been cited as powerful drivers of deinstitutionalization. Particularly important is the emphasis on patient rights and legal safeguards to unreasonable deprivation of liberty. The current study, thus, specifically addresses the following three questions:

1. To what extent have there been overall declines in the availability of psychiatric beds across nations?
2. Have there been significant differences in the level of deinstitutionalization based on resource availability as reflected by regional and national income levels?
3. To what extent can variations in levels of deinstitutionalization be accounted for based on national socioeconomic and cultural conditions?

METHODOLOGY

Overview

This project uses a methodology that is designed to serve descriptive and exploratory aims, including a regression analysis of data pertinent to the major questions of this study. It specifically employs a secondary analysis of existing data on psychiatric inpatient care derived from WHO's *World Mental Health Atlas* from 2001, 2006, 2011, and 2014 [8–11], as well as supplemental international sources.

Data

Information regarding the various features of the mental health services and systems of 201 nations were downloaded from the four online versions of WHO's *Mental Health Atlas*. These nations include the 190 member states of the WHO, as well as 11 associate member states. The dependent or outcome variable of the study–-changes in inpatient psychiatric care–-was calculated from the total number of psychiatric beds reported in the four editions of the *Atlas*, standardized as population rates. The available two to four rates were then used to calculate the slope, or line of best fit for changes of psychiatric beds over the editions of the *Atlas* that reported these figures. Average annual rates of change, decline or increase, were then calculated as an annual average percent rate of change, using the mean rate for the four years for each nation as the denominator. Thus, negative numbers represent an average annual percentage rate of decline in psychiatric bed availability, or deinstitutionalization, whereas positive numbers represent an average annual growth in bed availability, or institutionalization. These beds include all private and public psychiatric hospitals in each nation, including general hospital units and community psychiatric residences, but excluding nursing homes. Because of the unavailability of data pertinent the extent of community mental health system development, this study must restrict its focus simply to the reduction in inpatient bed availability.

The study's independent variables or predictors are listed in Table 3, along with their sources and selected descriptive statistics. These represent the following categories: demographics,

TABLE 1
Deinstitutionalization of Psychiatric Beds, by WHO Region and Income Category (n = 182)

WHO region				*WHO Income category*			
Name	*Median % annual change*	*SD*	*n*	*Name*	*Median % annual change*	*SD*	*n*
Africa	–1.93	4.36	51	Low Income	–.67	6.98	41
Asia & Pacific	2.91	4.17	41	Lower Middle Inc.	1.03	3.77	50
Europe	–.11	3.12	46	Upper Middle Inc.	–2.19	5.32	42
Latin Am. & Caribb.	–2.80	6.70	31	Upper Income	–1.40	4.37	49
North America	–3.54	1.23	2				
West Asia	–1.42	5.11	11				

Aggregated statistics weighted by relative population size.

TABLE 2
Deinstitutionalization of Psychiatric Beds, Changes in the 2000–2014 Period

10 Nations with greatest annual increases		*10 Nations with greatest annual declines*	
Nation	*Mean annual increase (%)*	*Nation*	*Mean annual decline (%)*
Nauru	12.65	United Arab Emirates	−12.90
Benin	12.82	Chad	−10.71
Bangladesh	12.88	Panama	−10.71
Slovakia	15.52	San Marino	−10.71
Australia	16.15	Lebanon	−10.18
Columbia	17.46	Angola	−10.04
Venezuela	23.12	Portugal	−8.24
Bhutan	24.33	Samoa	−8.11
Comoros	31.58	Congo (Dem. Republic)	−7.97
Dominica	66.67	Cyprus	−7.67

Mean = 0.98%; Median = −0.41%; SD = 4.86%; Other nations with intermediate levels include: Israel: 5.14%; Japan: 1.09%; Sweden: −3.89; United States: −3.92; and the UK: −2.65.

socioeconomic development, political conditions, cultural patterns, and geography (including relative location and region). Several of these variables are known to be highly intercorrelated, such as adult literacy, education, and Gross Domestic Product (GDP) which constitute the Human Development Index (HDI). The purpose of including the component indices is to permit the detection of the relative role of these component dimensions of the HDI, if these cannot be captured by the overall index. Included as a predictor variable is the Gini Index, one of the most widely used measures of economic inequality. When the index is 1, there is perfect inequality, with all resources owned by a single person, and when it is 0, all have perfectly equal shares [52].

It should also be noted that culture is operationalized here using the two dimensions identified by Inglehart and Welzel [53], employing all five waves of the World Values Survey for 1980–2005. These dimensions–-the extent of the Secular-rational orientation versus Traditionalism, and, the emphasis of individual Self-expression versus Survival values–-have been found to substantially capture many of the important features of national cultures. Under geography, the distance in miles from Paris was computed for each nation's midpoint to test for the possibility that the variations in national mental health systems is a function of relative distance from one of the pivotal cities in the early history of mental health, specifically Paris, where Philippe Pinel at the Hospital Bicêtre reformed hospital care for the seriously mentally ill in the late 1700s. This variable is used as an indicator measure, albeit a limited one, for the geographic diffusion of the influence of early European models of mental health hospital care.

Several of the mental health policy and related variables were also obtained from the *World Mental Health Atlas* [8–11] series. Dichotomous measures, such as the existence of a mental health or substance abuse program, are coded as "1" for present and "0" for absent. Several of the measures, such as goals, included in the mental health policy elements, Non-Governmental Organization (NGO) activities, or psychiatric drugs included in the national

TABLE 3
Potential Predictors of Deinstitutionalization of Psychiatric Bed: Descriptive Statistics

Predictor	*n*	*Mean*	*Median*	*SD*
Demographic				
Population, 2005*	189	5,180,084	157,935	553,351
Density (Persons/Sq. M.), 2005*	187	462.6	355.1	629.4
Racial/cultural Diversity, 2009**	179	0.48	0.51	0.28
% urban population, 2005*	189	49.2	41.0	20.8
Socioeconomic Development				
Human Development Index, 2006*	186	0.72	0.76	0.15
Dependency Ratio, 2005*	188	56.59	51.81	15.14
Adult literacy, 2002*	164	79.5	89.6	17.2
Education Index, 2006*	188	0.78	0.85	0.16
Unemployment, 2009*	180	5.94	5.02	3.21
Gross Domestic Product / per capita, 2006*	186	0.65	0.64	0.18
Gini Index	113	40.25	38.20	9.40
Political Conditions				
Democratization Index (gender adj.), 2006**	189	15.97	17.30	12.78
Cultural Characteristics				
Secular-rational vs. Traditional orientation***	163	–0.23	–0.34	0.48
Self-expression vs. Survival orientation***	163	–0.06	–0.10	0.33
Geography				
Land area (sq/miles), 2009*	187	1,572,014	946,911	1,622,281
Distance from Paris (miles)	189	4,303	4,684	1,694
Mental Health Policy & Programs				
Mental health program (1-yes, 0-no)	189	0.91	1.0	0.29
Mental health law (1-yes, 0-no)	189	0.67	1.0	0.47
MH budget (1-yes, 0-no)	189	0.88	1.00	0.329
Mental disability DALYS	189	2,776	2,429	718
Mental disability change DALYS	189	1.02	1.02	.04
Other				
Prison population (Walmserly, 2005–2013)	187	141.1	117.2	160.0
Prison population change (Walmserly, 2005–2013)	187	.01	.00	.03

Aggregated statistics weighted by relative population size.

*United Nations, Development Program, 2009. Human Development Report.

**Computed from U.S., Central Intelligence Agency, 2009 Ethnic groups. *The World Factbook*. Available at https://www.cia.gov/library/publications/the-world-factbood/fields/2075.html. Accessed October 2009.

***Inglehart, R. (2009) World Values Survey Data. Available at http://www.worldvaluessurvey.org/http:/hdr.undep.org/en/statistics. Accessed September 2009.

therapeutic drug plan, were converted to counts to capture the range of elements, activities, or drugs covered.

Service demand was measured through a proxy variable, the Disability Adjusted Life Years Scale (DALYS), and the change in DALYS's, derived from the Global Burden of Disease study [54]. A measure of the rate of imprisonment for each nation was also used, although it is an open question whether rates of imprisonment more likely function as causes or consequences of deinstitutionalization, or both. These were derived from data collected by the International Center for Prison Studies [55–57].

Sample

The nations examined include those for which valid data was included in at least two editions of the *Atlas* series. For 2001, there were 187; for 2006, 188; for 2011, 168; and for 2014, 181. However, due to missing data problems, particularly with several nations' data in the 2001 and 2006 period, the total available number was reduced to 161. This study's sample excluded colonies and territories of sovereign nations, as well as any nation for which there was only a single year of data available.

Analysis

Preparation of data for analysis consisted of the recoding and transformations as described in the foregoing section, as well as analyses and treatment of missing data. For the predictors, although virtually all of them were complete for above noted 161 nations, a few did have additional missing cases. The pattern of these missing values was analyzed with the Statistical Package for the Social Sciences (SPSS) missing values module, which revealed that they did not meet the criteria for being missing completely at random (MCAR). Thus, imputation of missing values was used, employing the expectation maximization (EM) algorithm from SPSS, which is a type of maximum likelihood estimation designed for the multivariate estimation of missing data [58]. This procedure resulted in the final selection of a subsample of 161 nations with complete data, some of which was imputed, with a slight underrepresentation of nations high on secular-rationality (mostly in western Europe), and similarly, a slight overrepresentation of the developing nations with low scores on this index.

Multiple regression was used for the final question to model the extent that changes in the availability of psychiatric inpatient beds, whether in general hospitals or specialty psychiatric hospitals, public or private, are a function of their geographic, demographic, socioeconomic, political, and cultural environments. Specifically, the rate of change of psychiatric inpatient care was regressed on the various indicators of national environmental conditions. A backward removal strategy for the deletion of nonsignificant predictors was used, which resulted in a final model with 17 predictors which contributed to the model at least a 0.05 level of significance. In addition, standard diagnostic statistics were computed, including the Durbin–Watson statistic, residuals. Overall predictability of each model was assessed using the Adjusted R^2 measure, along with its associated level of significance. The contributions of each of the predictors were examined through the lens of standardized and nonstandardized Beta coefficients, as well as partial correlation coefficients. The tolerance and variance inflation factor (VIF) values for each predictor were also examined to test for multicollinearity and found to be at acceptable levels.

Limitations

The most relevant limitation of this study is that several of the indicators used from WHO's *World Mental Health Atlas* surveys are of unknown reliability and validity. Unfortunately, the original data WHO reports do not report on any tests of the reliability or validity of the data. Typically, only a single governmental source is surveyed. A related limitation, affecting the potential generalizability of this data, consists of the varying patterns of missing data among

the outcome hospitalization variables, as well as several of the predictors. A third limitation is that many of the predictors were available at only a single point in time, and this complicated the interpretation of correlational findings from the estimated multiple regression model, or had an ambiguous time order in relation with the outcome in the case of the penal data. Nonetheless, the predictors all measured conditions much more enduring and pervasive, such that it would be unlikely that there would be significant reverse effects of the mental health systems on such predictive conditions.

RESULTS

The Sample

The initial sample examined in this study covers the overwhelming proportion of sovereign nations: 51 African; 41 Asian and Pacific; 46 European; 31 Latin American and Caribbean; 2 North American; and 11 West Asian nations, including the Middle East; in total, 161 nations (see Table 1). These are approximately evenly divided between low income nations (41% or 22.5%); Lower Middle Income (50% or 27.5%); Upper Middle Income (42% or 23.1%); and Upper Income (49% or 26.9%).

Question 1: Extent of Deinstitutionalization

Overall, there has been a median decline of close to one-half percent (0.41%) per year in the availability of psychiatric hospitalization beds across the world during the 2000–2014 period (see Table 1). Over a ten-year period this would be equivalent to a drop of about 4.3% in the median rate, with national population controlled for. Nonetheless, this has been a skewed drop, as there has been an increase in the mean rate, at 0.98% per year due to several outliers. In total, close to half (45.1%) of nations saw declines in excess of one percent (<−1.0%) per year; about one fourth (25.3%) had stable patterns of between 1.0% and −1.0%; and three-tenths (29.7%) saw increases in institutionalization (>1.0%). The greatest annual deinstitutionalization was reported in the United Arab Emirates (−12.90%), Chad (−10.71%), Panama (−10.71%), and San Marino (−10.71%), whereas the greatest increases took place in such outlying nations as Dominica (66.67%), Comoros (31.58%), and Bhutan (24.33%). The United States saw an average annual decline of −3.92%, continuing the already dramatic declines from 1955 to 2001.

Question 2: Breakdown by Region and National Income

The most dramatic levels of deinstitutionalization of psychiatric care took place in both North and South America, including the Caribbean (see Table 2). Whereas North America saw a median annual decline of −3.54%, Latin America and the Caribbean had a median decline of −2.80%. Most other parts of the world also saw a pattern of deinstitutionalization, with −1.93% in Africa; −1.43% in West Asia; and −.44% in Europe. The only areas with patterns of institutional bed growth were Europe, at 0.11%; and Asia and the Pacific, at 2.91%.

The above pattern is only partially reflected by the breakdown of the world's nations on the basis of the WHO's income categories. The only group that did not see a pattern of deinstitutionalization is that of the 50 lower middle income nations, which had a median annual increase of about one percent (1.03%) annually. The other three groups all saw declining access to inpatient care, with the upper income countries at −1.40%; the upper middle income at −2.19%; and the lower income nations at −0.67%.

Question 3: Predictors of Deinstitutionalization

The role of a range of geographic, demographic, socioeconomic, political, cultural, and mental health variables were examined as potential correlates and predictors of changes in the level of psychiatric inpatient care during the 2001–2014 period (see Table 4). After the progressive elimination of nonpredictive variables from provisional models, in the final model estimated, 17 predictors each contributed significantly to account for over half of the variation in deinstitutionalization levels (R^2 Adjusted = 0.557; $p = 0.001$). One of the most predictive is the Gini index, which is a measure of income inequality in a nation: The more unequal the income distribution is, the steeper has been the decline in levels of psychiatric hospitalization ($B = -0.814$; $p < 000$). At the same time, the greater ethnic diversity there is, the more accelerated the deinstitutionalization ($B = -0.304$; $p < 0.001$). Similarly, nations where there is a high HDI ($B = -0.457$; $p < 0.001$), as well as a high level of dependency (B = −0.289; $p < 0.011$), tend to have high levels of deinstitutionalization.

When the rate of persons with psychiatric disabilities is increasing, there have also tended to be decreases in psychiatric inpatient care ($B = -0.221$; $p < 0.001$). Similarly, the higher the imprisonment rate ($B = -0.281$; $p < 0.003$), the greater the movement toward reducing hospital care. Deinstitutionalized care was also found to be more pronounced in nations that are relatively close to Paris ($B = 0.404$; $p < 0.001$) (as an indicator for a key epicenter of mental health policy development) and high on the Index of Democratization ($B = -0.237$; $p = 0.037$). Also, the presence of a recently enacted formal mental health program ($B = -0.270$; $p = 0.011$) and a relatively high initial rate of psychiatric hospitalization ($B = -0.287$; $p = 0.001$) were both predictive of movement toward deinstitutionalized care. Similarly, the presence of a formal law governing psychiatric commitment was also associated with the process of deinstitutionalization ($B = -0.437$; $p < 0.001$). In contrast, the opposite trend of institutionalization was found to be predominant in nations with a substantial system of mental health services ($B = 0.451$; $p < 0.001$) and strong community mental health care ($B = 0.265$; $p < 0.001$).

Only one of the measures of the role of national culture proved to be predictive of changes in institutional care. The presence of a highly Secular-Rational culture, in contrast to a Traditional culture, was associated with movement toward deinstitutionalized care ($B = -0.245$; $p < 0.001$). It should be noted that each of the moderate to strong levels of predictability revealed by the standardized regression coefficients reported here represent the net effect of the predictor, after the model introduced statistical controls for the other eleven variables included in the final model.

Several of the hypothesized predictors that were tested did not prove to have significant effects, and thus they were not included in the final model reported in Table 4. Among those for which this result was least expected are the absolute level of mental disability in the nation.

TABLE 4
National Deinstitutionalization of Psychiatric Beds, Regressed on Selected Predictors (n = 161)

Predictor	*b*	*B*	*Probability*	*Zero-order correlation*	*Partial correlation*
Constant	−348.085		< .001		
Gini (Inequality) Coefficient, 2013	−.535	−.814	< .001	−.183	−.544
Ethnic Diversity	−5.489	−.304	< .001	−.320	−.310
Population Density	.001	.121	.049	.207	.159
Percent Population in Urban Areas	.142	.616	< .001	−.258	.339
Human Development Index	−18.317	−.547	.002	−.093	−.243
Dependency Ratio	−.097	−.289	.011	−.187	−.205
Secular-rational vs. Traditional orientation	−2.454	−.245	.055	.125	−.155
Distance from Paris (Miles)	.001	.404	< .001	.060	.392
Democratization Index, 2005	−.089	−.237	.037	−.397	−.168
Mental & Behavioral Disorders, rate of change	−25.583	−.221	< .001	−.173	−.253
Factor 1: General MH Services	3.104	.451	< .001	−.198	.274
Presence of a Mental Health Law	−4.451	−.437	< .001	−.397	−.316
Total rate (per 10,000) psych beds in MH hospitals	−.376	−.287	< .001	−.139	−.271
Factor 3: Community Mental Health Care	3.670	.265	< .001	.135	.284
Presence of a Mental Health Policy: Year	.308	.612	< .001	.113	.434
Mental Health Program: Year	−.103	−.270	.011	.185	−.203
Rate of Prisoners per 100,000 Population	−.008	−.281	.003	−.281	−.240
Model Statistics					
R	0.775				
R^2	0.601				
R^2 Adjusted	0.557				
SE Estimate	3.248				
F	13.534				
Sig. F	<0.001				
Regression DF	17				
Residual DF	153				
Total DF	170				

Data weighted by size of national population; the unweighted *n* is 161. Variables excluded from model: Unemployment rate; Substance Abuse policy; Latitude; Longitude; Mental health program; Culture–Survival orientation; Year of Mental Health Law; Mean annual rate of change in population rate of prisons; Population; Total land area; Mental & Behavioral Disorders total rate.

The effects of these predictors proved to be insignificant when controls for service demand, culture, geography, incarceration, and democratization were included and controlled for in the final model discussed in the foregoing paragraph.

DISCUSSION

Data analyzed pertinent to the study's first research question, that involving the extent of deinstitutionalization throughout the world, has revealed that although the decline of psychiatric inpatient beds is far from a universal phenomenon, it nonetheless characterizes the experience of many of the world's nations during the 2001–2014 period. The overall median decline of just under one-half percent (−0.41%) per year indicates that, in the aggregate, this is a fairly modest decline, notwithstanding dramatic changes in both directions in small subsets of nations.

As expected, a prior pattern involving the development of highly institutional systems of mental health care proved to be predictive of deinstitutionalization, and alternatively, that the lack of institutional care would be predictive of institutional growth. Data analyzed pertinent to the second question of this study, that involving regional variations in deinstitutionalization, reveals that North America, with its considerable history of institutional care, and its subsequent pattern of deinstitutionalization, saw continuing declines in beds during the recent 2001–2014 period examined. But contrary to expectation, Low income nations, particularly those in Africa with their minimal level of development of inpatient mental health services, unexpectedly saw further declines in inpatient care.

Perhaps the most important findings of this study consist in what is revealed regarding the third question, which concerns the correlates and predictors of changes in levels of deinstitutionalization. One of the strongest effects identified is that of income inequality and its association with reductions in institutional care. Whether such reductions are directed at maintaining inequality or in addressing the problem must remain a matter of speculation and debate, as the data examined does not lend itself to a persuasive interpretation. It is of interest that the racial and ethnic diversity of a nation also is associated with continuing deinstitutionalization. It may be that in more heterogeneous nations, there is less resistance to the integration of diverse racial and ethnic groups as they leave institutions.

It is paradoxical that nations with more recently enacted mental health policies are institutionalizing more so, whereas those with recently enacted mental health programs are deinstitutionalizing. This suggests that there may be a disjunction in many nations between the formal policies and the programs actually implemented.

The geographic and demographic characteristics of a nation were also found to play important roles in a nation's institutional mental health policies. The physical distance of a nation from Paris, France was used here as an indicator of the diffusion of institutional care which is historically associated with the contributions of Phillipe Pinel toward the development of specialized psychiatric care in hospitals, beginning in Paris in the late 1700s. Those nations that are most distant, particularly those in East Asia and the Pacific, continue to experience the effects of such patterns of development in institutional care, whereas those closer have clearly moved in alternative directions, perhaps to compensate for their earlier influence of Pinel and overreliance on institutional care.

Of particular interest are the effects of political and cultural conditions, as challenging as it is to offer persuasive interpretations of such effects. For instance, the more democratic is the

nation, the greater is the development of deinstitutionalized care. Certainly, in democratic nations, separable goods and services prove to be an important means for building a political base. Community, rather than institutional mental health services, better serve such ends. Furthermore, it might be expected that democratic nations will manifest greater tolerance for the seriously mentally ill, and thus, generate more supportive and inclusive community services. Similarly, the finding that nations with Secular-rational cultures, rather than Traditional ones, are associated with greater deinstitutionalized care is not unexpected given potentially greater tolerance by communities for the seriously mentally ill.

One other noteworthy and statistically significant effect is the association of the rate of imprisonment with a shift toward deinstitutionalized mental health care. This confirms several recent studies that have supported the historic Penrose Hypothesis [59]. This is the idea, dating back to the observation of Lionel Penrose [22] in the 1930s, that there is an inverse correlation between psychiatric inpatient care and levels of incarceration see also [20, 21]. This study cannot confirm whether the movement to deinstitutionalized care is more of an effect or a cause of high rates of incarceration, or both. Nonetheless, it is reasonable to assume that to the extent that seriously mentally ill individuals are imprisoned, there will be less pressure to hospitalize them, and vice versa. In this study, a moderately strong inverse correlation ($B = -0.281$; $p > 0.003$) was found after a variety of other important predictors are controlled for. Further research is needed to determine the direction of the effect, or the possibility of an interactive relationship.

An important caveat underlying this analysis is that it did not focus on the consequences of the changes in psychiatric inpatient care. Thus, it is not possible to conclude what might be optimal levels of inpatient and community care. Nonetheless, the wide variance in the extent of these changes suggests that most nations are mostly responding to local conditions, rather than world-wide trends. Over half of the variation in reductions and increases in psychiatric inpatient care can be locally explained. If this is so, then it suggests that national mental health authorities are clearly moving to identifying unique local solutions to finding an optimal or balanced level of inpatient and outpatient care, whatever this balance may mean in a given nation. Any nation that deviates too dramatically from such an ideal will soon need to adjust its course. As supportive as these findings are for a wide variety of hypotheses, the fact remains that a substantial degree of variation in changes in inpatient care remains unexplained (44.3%). Thus, follow-up research is needed for the identification and assessment of the specific dynamics through which the predictors hypothesized in this study, as well as a variety of others, dynamically function, and how they might be either modified or more effectively responded to by mental health advocates, planners, and administrators.

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