MENTAL HEALTH INFORMATICS

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OXFORD

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Mental Health Informatics

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Preface

INFORMATICS IS THE creative use of information and technologies in support of patient care, education, and research. Informatics deals with resources, devices, applications, and formalized methods for optimizing the storage, retrieval, and management of information for clinical problem solving and decision making.

More specifically, health informatics is an interdisciplinary field based upon literature in the computer and information sciences, the cognitive and decision sciences, the health sciences (including public health and epidemiology), the medical sciences, and the telecommunication sciences. Whether we are looking at e-health, m-health, or x-health (as in the still-unknown application), health informatics continues to develop new methods and techniques to enhance health care, academic and applied services research, and education. From our perspective, informatics technology ranges from the plain old telephone service (POTS) to high bandwidth applications, from a focus on individual care to administrative analyses to systems-wide public sector care.

Mental Health Informatics examines critical issues of how computers and information technology improve the organization, financing, and delivery of mental health services and services research. It combines a discussion of the core issues in informatics (including data and standards, management information systems, adoption, legal issues, and information strategies) together with research competencies, databases, globalization of information, and implications for policy and practice in mental health.

This book evolved from our experiences in teaching a graduate-level behavioral health course in mental health informatics at the University of South Florida (USF) College of Public Health and the College of Behavioral and Community Sciences. No single text provided an adequate knowledge base for our course. Other health and mental health informatics textbooks have examined mental health from a clinical perspective or have focused primarily on database design. As we taught the class, we realized that we lacked a definitive text that would address the structural knowledge necessary to understand how health

information is used in decision making, public health programming, and outcomes assessment. Even more important, we needed a book that would provide a good overview of the complexity of health services research from an information perspective as well as the perspective of the secondary and tertiary data user.

This text presents a unique public health perspective of mental health informatics. The course blends the public health, mental health, services research, and library and information sciences perspectives of mental health informatics. We examine informatics from a wider behavioral health perspective, which encompasses the areas of alcohol, drug abuse, and mental health services. The text covers public sector (local, state, and federal government agencies) and private sector practice, as well as the practice, administrative, and educational aspects of behavioral health (defined as alcohol, drug abuse, and mental disorders viewed from a public health perspective).

Mental health includes elements of many other specialty fields, including medicine, the social and behavioral health sciences, criminal justice, social work, and rehabilitation. Public mental health care may be acute or long-term care, and it emphasizes a focus on a particular at-risk population. Mental health services are offered in hospitals, general and specialty providers' offices, community mental health centers, peer-run centers, religious organizations (pastoral care), academic health centers, jails and prisons, state and local government facilities, military and Veterans Administration medical centers, and private facilities. At the same time, users of data generated by mental health services include a wide range of stakeholders, including consumers, families, providers, payers, managed care organizations, state mental health authorities, federal agencies, administrators, researchers, policy makers, advocates, and criminal justice personnel.

In 2003, the New Freedom Commission on Mental Health made a number of recommendations to fundamentally transform the delivery of mental health services in the United States. Goal 6 from the New Freedom Commission on Mental Health specifically addressed technology to improve access to and coordination of mental health care. The use of technology has two major aims. The first aim addresses advancing research in the development of evidence-based practices to treat individuals with mental and substance use disorders, with the ultimate goal of preventing mental disorders and promoting recovery among individuals with mental illnesses. The second aim is the effective use of technology to maximize diffusion, early adoption, and effective implementation of efficacious and effective practices and to improve service provision and service utilization.

Technology is also relevant to workforce development issues in assuring that current and future practitioners have access to and utilize evidence-based services. In addition, technology is a critical component in developing the knowledge base in mental and substance use disorders, particularly in the areas of disparities, trauma, acute care, and long-term consequences of medications. Finally, integrated information technology (e.g., electronic health records) and communications infrastructure (e.g., telehealth networks) require substantial investments, but are critical to the effective delivery of mental health services.

Informatics also builds upon and links numerous other national initiatives, starting with the electronic health record (EHR). With the implementation of the EHR come new data standards that have changed in terms of what is measured, what is counted, what is assessed, and what the outcomes are to establish the quality and effectiveness of mental health services.

Tied closely to the EHR is the national health information infrastructure (NHII). Numerous governmental and nongovernmental organizations are involved in the development of the NHII within the United States, setting standards related to the architecture, content, storage, security, confidentiality, exchange, functionality, and communication of health and mental health information. Communication of health and mental health information addresses record formats, such as the continuity of care record (CCR) standard that is a longitudinal record of all of a patient's treatment trajectories, and the standardization of existing clinical vocabularies and messaging standards into an interoperable federal health data system.

The emergence of translational research in public health has pushed informatics to an even more prominent role in health and mental health services research as it seeks to integrate health information technology, electronic medical record systems, clinical trial management systems, clinical research informatics, statistical analyses, and data mining.

Telecommunication and information technology, including the Internet, holds enormous potential for transforming mental health services delivery systems in America. Central to the application of information science and technology to promote mental health and prevent mental disorders in at-risk populations is the establishment of an infrastructure to develop comprehensive integrated health surveillance and information systems that bridge programmatic boundaries within communities. Thus, there remains great potential for mental health informatics to play an important role in the integration of a variety of data (e.g., census, surveillance, and hospital) if more emphasis is placed upon updating national efforts to collect more current mental health and substance abuse data.

Mental Health Informatics offers an examination of contemporary issues that focuses on the innovative use of computers and information technology in support of patient care, education, and mental health services research and delivery. Fourteen chapters are divided into four main parts: (I) Introduction; (II) Standards and Implementation; (III) Competencies and Strategies; and (IV) Globalization and the Future.

Part I covers basic concepts, definitions, and the history of mental health informatics. It has been our experience that students had an understanding of either mental health or technology but not an integrative perspective of how informatics is used in mental health services, research, or policy.

Building upon the overview, Part II of the book provides an account of the development of a national electronic health record, the issues involved in developing data sets for a variety of uses within mental health organizations, current standards development, and the implications and future of the electronic health record in mental health. With a focus on decision making, operations management, cognitive support, and usability, we also discuss comparative effectiveness research, patient portals, and report cards as key components in mental health management information systems. Part II also explores the issues involved in the adoption and implementation of mental health information technology, including the nature of teamwork in health and mental health, as well as legal and ethical issues involved in the use of informatics in the provision of care.

The intensive computational and technology skill sets necessary to work with data today require additional approaches to literacy. With that in mind, Part III focuses on the research competencies that are needed to move research to practice, preparing researchers to work in increasingly data-intensive information and computing environments. Understanding

how competencies are framed across knowledge, skills, and attitudes allows us to work from and across macro-, meso-, and micro-levels of how information and processes intersect. We also examine how data establishes future research priorities and explore information-seeking strategies.

In Part IV, we step outside the United States and review international aspects of telemental health, including the creation of globally accepted measures and standards, issues in tracking health care services, and operational reforms in developing and emerging nations. We conclude the book by examining the challenges faced by public health and mental health providers, educators, and researchers. We present emergent trends, upcoming legislation, and new ways of conceptualizing the intersection of mental health services research, public health practice, and informatics.

Although it is impossible to examine all of the relevant issues in mental health informatics in a single volume, this text underscores the importance of establishing a public health framework for the study of mental health informatics. We hope that our public health approach provides a useful starting point for future research and policy making in the area of mental health informatics.

The text has been designed for a variety of audiences, including: (1) graduate students and post-doctoral fellows in the public health, behavioral health, and information science fields; (2) professionals currently managing mental health programs and information systems in hospitals, managed care organizations, mental health clinics, and community mental health centers; and (3) policy makers and professionals in mental health services delivery within local, regional, state, and national levels of government.

Throughout the preparation of this text, several individuals at Oxford University Press provided encouragement and continued support. We are grateful to Craig Panner and Kathryn Winder for their valuable suggestions and advice, and to the Press's staff for copyediting and design supports. In addition, special thanks to Ms. Meghan Haggard and Ms. Melissa Tirotti at USF for their valuable support in the final preparation of this text. Finally, we would like to dedicate this book to our families for their love, generous understanding, and unwavering encouragement in our efforts to write and complete this text.

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Part 1 Introduction

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[Public health is] the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort for the sanitation of the environment, the control of communicable infections, the organization of medical and nursing services for the early diagnosis and prevention of disease, the education of the individual in personal health and the development of the social machinery to assure everyone a standard of living adequate for the maintenance or improvement of health.

CHARLES-EDWARD AMORY WINSLOW, 1920, pp. 6–7

1   Informatics and Public Health

Introduction

Informatics is a field that focuses on the creative use of computers, information systems, and other information technology in support of education, research, and applications for improving the overall quality of life. It is found in all disciplines and deals with resources, devices, and formalized methods for optimizing the storage, retrieval, and management of information for problem solving and decision making. More specifically, health informatics is an interdisciplinary field, based upon literature in computer and information sciences, the cognitive and decision sciences, the health sciences (including public health and epidemiology), medical sciences, and telecommunication sciences. Researchers in health informatics have discovered new methods and techniques to enhance health care, academic and applied services research, and education through the application of information technology.

The emergence of health informatics can be attributed to three major factors: (1) the rapid evolution of technology; (2) the growth of information management; and (3) the continued development of decision support systems. The changes in computing and communications technology are now read, viewed, or heard daily in the media. For example, e-business is presented as a high-profile commodity via daily advertisements. It is apparent that traditional paper-based methods for handling daily communication, patient information, and biomedical knowledge have become unmanageable and expensive, particularly with the continued demand for technology within managed health care. Finally, it is important to realize that other information databases are as important to current health and mental health management decision making as the traditional clinical and research databases.

Telecommunication also plays an increasingly important and prominent role within the health care field, where the most remarkable opportunities, along with associated challenges and obstacles, have emerged in relation to telecommunication initiatives. For example, telecommunication or "telehealth" strategies continue to broaden access to health and mental health care, health education, and health services delivery for at-risk populations in America. The development of computer-based patient records, personal health information systems, and unified electronic claims systems utilize various electronic communication technologies to streamline and centralize databases (Levin & Hanson, 2011).

For the purposes of this text, health informatics will be viewed from both public health and behavioral health perspectives. Behavioral health encompasses primarily the areas of alcohol, drug abuse, and mental health services, all specialty areas within public health. Nevertheless, throughout this text, the terms *mental health* and *behavioral health* will be used interchangeably. In addition, this text will primarily cover the public sector (local, state, and federal government agencies) and private sector practice, as well as the administrative, services delivery, and educational aspects of behavioral health informatics.

Telemedicine, Telehealth, and Health Informatics

Telemedicine "began" in the 1950s as physicians who were geographically remote from their patients rendered treatment or provided consultations over the telephone and/or through wire services. Today, although the principles are largely the same, the technology and milieu of contemporary telemedicine are vastly different. In the age of high-speed data lines, advanced data compression technologies, the privatization of federal technologies, and the computerization of patient medical records, clinical outcomes, and physician practices, telemedicine promises to be the next milestone in health care advances.

Telehealth has been described as the use of communications and information technology to deliver a variety of health care services, information, and education to participants who are not able to be at the same place to receive these services (Field, 2002). This helps to improve access to health care and helps to overcome the geographic, transportation infrastructure, and socioeconomic barriers to treatment in a timely fashion. Telehealth may include clinical consultation, continuing professional education, health promotion, and health and mental health care management and administration. Telehealth technologies initially included videoconferencing, telephones, computers, the Internet, e-mail, fax, radio, and television. More recently, technologies are increasingly being introduced and utilized in health care, through a variety of social media, including blogs, texting, Twitter, wikis, digital portfolios, and portals. In addition, programs deliver health care using a combination of audio graphic, store-and-forward, and telemetry technologies (the automatic transmission and measurement of data from remote sources by wire, radio, or wireless technologies).

Health informatics covers a very wide range of applications for delivering services and for applied services research, all dedicated to the improvement of patient care and public health. Health informatics continues to incorporate rapidly changing information environments and continues to encounter emerging public health issues, some created by the

advent of new technological opportunities, while others emerge through the application of technology to complex public health problems. For example, applications range from electronic patient records to national health databases in the establishment of clinical guidelines and clinical (referral) pathways to care. The key component of health informatics is the process of converting data to accessible and usable information that enables improvements in the quality, value, and effectiveness of health and mental health services.

Electronic information systems are revolutionizing health care practice, health research, and health education. Efficient management of information improves patient satisfaction and creates the development of new aspects of clinical practice, as well as creating new opportunities for implementing health education initiatives. Many health care professionals realize that they are in need of additional skills and knowledge in finding and using information, and in assessing health information systems.

The proliferation of interest in health informatics has centered on the technical and sociological aspects of the medium. It is only recently, however, that legal and regulatory issues have been discussed. In fact, the potential for mass availability of telemedicine and telehealth information and services will likely depend upon how the legal and regulatory issues are resolved. The rapid development and growth of health information and communication technologies provide a wealth of opportunities to create new approaches for the delivery of health, mental health, and substance use services. Accordingly, mental health informatics is the systematic application of health information and computer science and technology to mental health practice and applied services research.

The remainder of this chapter will present some basic concepts in public health so that readers will understand the public health approach to informatics. The next chapter will address basic topics in mental health services delivery from a public health or population perspective.

Public Health

INTRODUCTION

Historically, in academic research and in the academy, it is common to examine problems from a (single) discipline-specific perspective. The advantage of this discipline-specific perspective includes a comprehensive literature base with theoretical frameworks that help guide future research and teaching in that discipline. The disadvantage of examining problems from a single perspective lies in the loss of potential contributions from other related disciplines in examining issues or problems that might draw contributions from a multi-disciplinary perspective.

Unlike academics, where knowledge-based areas are traditionally organized by discipline-oriented departments, the field of health care has historically utilized a multi-disciplinary team approach to services delivery, where improving health and clinical outcomes involves the utilization of evidence-based practices, with multidisciplinary health care teams providing services to patients. This was particularly true with the advent of prepaid health plans in early twentieth-century America.

The field of public health, by definition, utilizes a multidisciplinary approach to examining health and mental health problems in at-risk populations. It draws heavily from the areas of biostatistics and epidemiology, environmental and occupational health, health policy and management, and community and family health to address health issues and problems from a population perspective.

While most definitions of public health include advancing a healthy lifestyle for communities through the promotion of health and the prevention of disease, one particular definition of public health was suggested in the early twentieth century by Charles-Edward Amory Winslow, a pioneer in public health practice in America:

> [Public health is] the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort for the sanitation of the environment, the control of communicable infections, the organization of medical and nursing services for the early diagnosis and prevention of disease, the education of the individual in personal health and the development of the social machinery to assure everyone a standard of living adequate for the maintenance or improvement of health. (Winslow, 1920, pp. 6–7)

Toward the end of the twentieth century, the Institute of Medicine's (IOM) Committee for the Study of the Future of Public Health (IOM Committee) published *The Future of Public Health*, which examined public health programs and the coordination of services across U.S. government agencies and within state and local health departments. The Committee defined the *substance* of public health as "organized community efforts aimed at the prevention of disease and promotion of health" (Institute of Medicine, 1988, p. 41) and defined the *mission* of public health as "the fulfillment of society's interest in assuring conditions in which people can be healthy" (Institute of Medicine, 1988, p. 40).

The IOM Committee also identified three core functions of public health: (1) assessment; (2) policy development; and (3) assurance (of providing necessary public health services in the community). Subsequently, the U.S Public Health Service convened the Public Health Functions Steering Committee (1994), a national work group chaired by the Surgeon General, which developed 10 essential public health services needed to carry out the basic public health core functions in a community:

1. Monitor health status to identify community health problems;
2. Diagnose and investigate identified health problems and health hazards in the community;
3. Inform, educate, and empower people about health issues;
4. Mobilize community partnerships to identify and solve health problems;
5. Develop policies and plans that support individual and community health efforts;
6. Enforce laws and regulations that protect health and ensure safety;
7. Link people to needed personal health services and assure the provision of health care;
8. Assure a competent public health and personal health care workforce;

9. Assess effectiveness, accessibility, and quality of personal and population-based health; and

10. Research for new insights and innovative solutions to health problems.

Thus, while there are a variety of definitions and functions of public health, common elements include a population-based, multidisciplinary approach that emphasizes health promotion and disease prevention, even at an international level (World Health Organization, 2012). Furthermore, a public health approach involves both formal activities undertaken within government, combined with efforts by private and voluntary organizations and individuals, working together to focus on maintaining the health of populations. This public health framework of problem solving includes (1) problem identification (utilizing epidemiologic surveillance); (2) identifying risks and protective factors; (3) development, implementation, and evaluation of interventions; and (4) monitoring implementation in relation to the impact on policy and cost-effectiveness. It also requires the determination if a disease is preventable or not preventable, controllable or not controllable, as well as its priority compared to other incidences of disease outbreak.

The remainder of this chapter will examine selected topics in public health. Where possible, the public health topics included below will contain a brief discussion of how that area is related to the field of informatics.

EPIDEMIOLOGY

Epidemiology, a fundamental science of public health, is the study of the factors that determine the frequency and distribution of disease in (human) populations. In medicine, physicians focus on individual patients; in public health, on the other hand, epidemiologists focus at a population level, that is, on a community or a specific population at risk for selected diseases. Thus, in public health, the community replaces the individual patient as the primary focus of concern (i.e., the "unit of analysis"). The objective is to evaluate the health of a defined community, including those members who would benefit from, but often do not seek, health care services. In epidemiology, disease does not occur in random fashion and may have multiple causal factors. Factors whose presence is associated with an increased likelihood that disease will develop at a later time are called risk factors.

Epidemiologic studies may be applied to all diseases, conditions, and health-related events. *Endemic occurrence* is defined as the habitual presence of a disease or infectious agent within a geographic area, or the usual prevalence of a given disease within such an area. The term is used in contrast with *epidemic*, or the occurrence in a community (or region) of a group of illnesses of similar nature, clearly in excess of normal expectancy. An epidemic includes any kind of disease, exists whenever the number of cases exceeds what is expected on the basis of past experience for a given population, has no specific geographic limitations, and may encompass any time period.

Two common terms used in the measurement of disease frequency in epidemiologic studies are *incidence* and *prevalence*. Incidence rates are designed to provide a measure of the rate at which people without a disease develop the disease during a specified period of time, that is, the number of new cases of a disease in a population during a specified

interval of time (e.g., the number of new cases of schizophrenia per 100,000 persons in one year). The population in which the incidence is measured is restricted to those who are susceptible to getting the disease during the observation time period. This restricted population generally is called the *at-risk population* because they are at risk for contracting the disease. Incidence allows researchers to study the impact of harmful exposures or preventive interventions on the occurrence of disease because it does not depend upon the length of disease course or its fatality.

Prevalence rate measures the number of people in a population who have a disease (i.e., the existing cases) in the total population at a particular time (point prevalence), or during a stated period of time (period prevalence). Thus, incidence reveals the rate at which new illness occurs, whereas prevalence measures the "residual" of such illness, the amount existing at a given point in time in a community. Prevalence depends upon two factors: how many people have become ill in the past, and the duration of their illnesses.

SURVEILLANCE

Surveillance is the ongoing systematic collection, analysis, and interpretation of health incidence data. Comprising population- and/or individual-based data, surveillance data monitors the incidence of disease to establish patterns of progression. Surveillance helps us to predict, observe, and minimize the harm caused by chronic and acute illnesses, such as outbreaks, epidemics, and pandemics. It also increases our knowledge of the factors that may contribute to the diagnosis and treatment of disorders. A key part of modern disease surveillance is case reporting. Examples of mental health surveillance data are the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS) and the Substance Abuse and Mental Health Services Administration's (SAMHSA) National Survey on Drug Use and Health (NSDUH).

PREVENTION

Primary, secondary, and tertiary prevention provide the foundation for the public health model of prevention and form the underlying principles for avoiding and controlling public health problems. However, in the case of mental health, these concepts are more difficult to apply. The causes of many mental disorders are not fully understood, due to the complexity of the etiology of mental disorders, the lack of knowledge on disease triggers, and the lack of complete understanding of disease emergence, progression, and subsidence from a physiological perspective. Hence, the avoidance of the occurrence of an illness, which is true primary prevention, often eludes researchers and practitioners in the field of mental health. Although great progress has been made in the genetics of diseases such as early onset Alzheimer's disease, we are still very distant from a basic knowledge of the genetic predispositions of many mental disorders. Even though there has been a great deal of "social engineering" attempted to prevent the occurrence of mental disorders, there is little evidence that these efforts have been successful (Levin, Hanson, & Hennessy, 2004; Levin, Hanson, Coe, & Kuppin, 2000).

Secondary prevention is the avoidance of disease recurrences or exacerbations post–disease diagnosis. This has been a more achievable goal in mental health. With early

identification and intervention, it is possible to stabilize many mood disorders, allowing individuals to lead productive, relatively unimpaired lives (Levin, Hanson, & Hennessy, 2004). Early intervention in other diagnostic groups of mental disorders has varying chances of success (Bird et al., 2010). However, considering the magnitude of the disabilities, particularly from a developmental perspective, such intervention is justifiable. To show the efficacy of secondary prevention, high-quality program evaluation is critical.

Finally, tertiary prevention is the reduction of disability and the utilization of rehabilitation. A substantial portion of mental health services for individuals with serious mental disorders is categorized as tertiary prevention. The mental health field can document considerable success through a number of program initiatives, including community support programs, positive assertive community treatment, psychosocial rehabilitation, and systems of integrated services delivery (U.S. Department of Health and Human Services, 1999). When we examine the direct and indirect costs of the suffering and the care of individuals with mental illnesses and their families, mental health professionals readily justify costs. However, the funding of public mental health programs is a political process, and it is critical to clearly demonstrate the cost-benefits of mental health treatment to the public, as well as to state and federal lawmakers. Effective data collection and analyses, including cost, efficacy, and outcomes, are key to defending these programs in terms of cost-effectiveness and long-term successful outcomes for persons with serious mental illnesses.

EVIDENCE-BASED PRACTICE

Clinical guidelines are those guidelines developed to assist in "best practice" treatment initiatives in order to be useful in diagnosis and treatment. These guidelines are often the foundation of evidence-based practices (EBP). EBPs are those research practices that have undergone and passed rigorous scientific and clinical practice review.

Evidence-based practice in behavioral health, for example, is an emerging field. There are a number of organizations and agencies that are authoritative sources for clinical guidelines, best practices, and EBP in the behavioral health field, including the National Registry of Evidence-Based Programs and Practices (http://www.nrepp.samhsa.gov/), the Cochrane Collaboration (http://www.cochrane.org/), and Blueprints for Violence Prevention: Center for the Study and Prevention of Violence (http://www.colorado.edu/cspv/blueprints/index.html). Data from EBP provide new ways of thinking about services delivery and what works best for whom, helping to reframe clinical treatment as well as services delivery frameworks. This allows more systemic and innovative approaches to translating research to clinical practice and clinical practice to research.

MANAGED CARE

Managed care is an evolving array of health care review and service coordination mechanisms that ultimately attempts to control (i.e., reduce) health services utilization and costs, to improve efficiency and services coordination, to increase access to preventive services, and to improve the quality of health care (Frank & McGuire, 2004). Managed care organizations (MCOs) are constantly evolving entities of various organizational structures and arrangements. A managed health care plan (MHCP) may be one or more products or

entities that integrate financing and management with the delivery of health care services to an enrolled population. An MHCP may employ or contract with an organized provider network that delivers services and that (as a network or individual provider) either shares financial risk or incorporates various incentives to deliver high-quality and cost-effective services. Most MHCPs use information systems capable of monitoring and evaluating utilization and cost patterns of their enrolled population.

COMMUNITY MENTAL HEALTH

The history of caring for individuals with mental illnesses is crucial in understanding the development of public health services, particularly the role of deinstitutionalization, which led to the development of the community mental health system in America (Deutsch, 1946; Regier et al., 1978; Drake et al., 2003). Table 1.1 briefly summarizes the prevailing eras for how individuals with mental illnesses were treated in America.

Community mental health services are the treatment of persons with mental illnesses in a community-based setting rather than in a hospital or psychiatric hospital environment.

TABLE 1.1

Eras of Mental Health

Era	Time	Advocates	Location	Theoretical framework
Age of Restraint	1773–1836		Home or wilderness	Containment
Moral Treatment	1836–1862	Pinel, Tuke, Rush, Dix	Asylum	Humane, restorative treatment
Custodial Care	1862–1900		Asylum	Personal and public safety
Mental Hygiene	1900–1955	Beers, Meyer, Deutsch	Mental hospital or clinic	Prevention, early intervention, promotion
Community Mental Health	1955–1977	Felix, Anthony, Chamberlin,	Community mental health center	Deinstitutionalization, community (re)integration
Systems Delivery	1977–1981	Carter, Hatfield, Lefley, Anthony, Deegan	Local communities (CASSP, PAMII)	Social welfare concern
Managed Care	1974–1990	Frank, McGuire, Pardes	Local communities	Community support, recovery
Behavioral Health	1990–Present	Rubinow,	Local communities	Decade of the brain, disease management, prevention

Ten elements were determined to be essential to ensure successful outcomes for persons with mental illnesses in the community. These included (1) a responsible case management team; (2) residential care; (3) emergency care; (4) Medicare care; (5) halfway houses; (6) supervised (supported) apartments; (7) outpatient therapy; (8) vocational training and opportunities; (9) social and recreational opportunities; and (10) family and network attention (Turner & Tenhoor, 1978).

Today, community mental health services provide a variety of mental health services, from traditional mental health treatment programs to vocational programs and rehabilitation counseling. A variety of additional programs are provided, including supported housing, employment, and education; partial hospitalization; local primary care medical services; clubhouses and peer-run services; and self-help groups for mental health. The significance of community mental health services is to provide the necessary services and supports so that persons with mental illnesses can remain integrated in their local communities and can be productive as well as functioning members of society.

PHYSICAL HISTORY

A physical history is the patient's treatment history, defined as whether he or she had ever received treatment prior to the current episode of care, and, if so, where. A history often is in the form of an interview and may include physical examinations, basic patient demographics, medications, allergies, and the presenting problem(s) or complaint(s) that brought the patient to the practitioner. In addition, the practitioner usually takes a family history, developmental history (including stresses and transitions), and a social history (education, occupational history, religion, etc.), which also documents linguistic and cultural issues that may be relevant in determining treatment. The service history is an essential part of the evaluative process, not just of the patient's current state but also in determining effectiveness of treatment and short- and long-term patient outcomes. Traditionally, this data may be kept in paper files, but increasingly these data are now part of the electronic health record.

LEVEL OF FUNCTIONING

Severity and level of functioning measures an individual's level of everyday functioning and comparison with pre-morbid (before onset of diseases) functioning (Murray & Lopez, 1996). Relevant aspects of daily living include daily living skills, social and recreational skills, financial skills, vocational skills, interpersonal skills, and parental skills. The point of measuring level of functioning is to assess how much the illness has affected the person and to use that information in designing appropriate levels of psychosocial treatment.

PROGRAM EVALUATION

Effective program evaluation is a systematic way to improve and account for public health services delivery and programmatic improvement. Program evaluation addresses how effectively decision making and administrative functions are performed, services are delivered, and whether outcomes meet quality, patient, and service goals, as well as accountability

guidelines. Quality assessment tools include system performance indicators, report cards, and consumer outcome measures, all of which use guideline fidelity measures (standards). They comprise domains that are issues, categories, or topics of interest. Indicators are measurable activities, events, characteristics, or items that represent a domain. Measures are the instruments used to assess, evaluate, and measure an indicator.

In public health evaluation, the following questions are asked:

- What will be evaluated? (i.e., what is the program and in what context does it exist?)
- What aspects of the program will be considered when judging program performance?
- What standards (i.e., type or level of performance) must be reached for the program to be considered successful?
- What evidence will be used to indicate how the program has performed?
- What conclusions regarding program performance are justified by comparing the available evidence to the selected standards?; and
- How will the lessons learned from the inquiry be used to improve public health effectiveness? (Milstein & Wetterhall, 1999).

The data collected to effectively answer these questions come from a variety of sources (including census data, surveillance data, and needs assessments) and from numerous data sources at local, state, regional, and national levels. The synthesis of data and information required to determine the effectiveness of programs, including patient outcomes, requires an understanding of public health systems and informatics.

IMPLICATIONS FOR MENTAL HEALTH INFORMATICS

This chapter was designed to give readers a basic understanding of public health and how the field views the world through an informatics perspective. For those with a basic understanding of public health, part of this chapter may seem like a review of basic principles. However, for those who are looking at the dual areas of public health and informatics for the first time, this overview is necessary.

The next chapter will briefly highlight some basic areas of mental health and mental disorders, viewed from a public health perspective. This will be followed by an overview of informatics in mental health services delivery.

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