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Patterns and policies in pediatric behavioral health visits to emergency departments in the United States

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Thesis

**PATTERNS AND POLICIES IN PEDIATRIC BEHAVIORAL HEALTH VISITS
TO EMERGENCY DEPARTMENTS IN THE UNITED STATES**

by

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B.A., Johns Hopkins University, 2017

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ABSTRACT

Hospital emergency departments (EDs) serve a critical role in its non-discriminatory evaluation and stabilization of all individuals who present for care, regardless of ability to pay. However, EDs are not adequately prepared or capable of caring for children and adolescents who are in behavioral health crisis and require acute treatment. The frequency and duration of pediatric ED visits have also increased over time, leading to crowded EDs, suboptimal delivery of behavioral health care, and strain on hospital resources. In response, hospital systems, states, and the federal government developed a variety of policies to support EDs in the delivery of high-quality care and improve pediatric behavioral health outcomes. Numerous drivers involving the low supply of pediatric behavioral health care professionals, high demand for emergency behavioral health evaluation and treatment, and fragmentation of the behavioral health care system interact to continue to drive patients to EDs despite the implemented policies. Further investigations are needed to exactly determine patients' unmet needs and identify root causes of pediatric behavioral health ED visits. Last, pediatric behavioral health care policy must not only expand on individual policy successes but also take innovative, value-based approaches to effectively address the worsening pediatric behavioral health crisis.

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LIST OF ABBREVIATIONS

ACA	Affordable Care Act
ED	Emergency Department
EMSC	Emergency Medical Services for Children
EMTALA	Emergency Medical Treatment and Labor Act
EPSDT	Early and Periodic Screening, Diagnosis, and Treatment
HRSA	Health Resources and Services Administration
InCK	Integrated Care for Kids
NHAMCS	National Hospital Ambulatory Medical Care Survey
NPRP	National Pediatric Readiness Project
PECC	Pediatric Emergency Care Coordinator
PHIS	Pediatric Health Information System
US	United States

INTRODUCTION

The Role of the Emergency Department

Emergency departments (EDs) in the United States serve a critical role as a safety net for individuals seeking medical care. Patients who do not have an established relationship with a primary care physician or are seeking medical advice after business hours rely on the ED to evaluate and stabilize any medical condition in a non-discriminatory manner. Patients are even referred to the ED by physicians or health care facilities that are not adequately staffed or equipped, especially for rapid access to diagnostic laboratory testing or radiological imaging studies. Since 1986, hospitals have been federally mandated by the Emergency Medical Treatment and Labor Act (EMTALA) to medically examine and potentially treat all patients who present to the ED for care, regardless of their ability to pay.¹ EMTALA was designed to prevent private hospitals from transferring uninsured patients to public hospitals without consideration of their medical stability for the transfer. Because EDs could not lawfully turn patients away or shift responsibility to another facility, they became a major point of access for medical care.

Furthermore, EDs and emergency medicine physicians are positioned on the front line of public health crises, including suicide and substance abuse epidemics. Such crises are often characterized by chronic and unmet health needs that are punctuated by acute exacerbations of underlying conditions. Understanding patterns of ED visits can help inform hospitals, policymakers, and legislators about the urgent health care needs on a population level.

Pediatric Visits to the ED

Pediatric Health Care Regionalization

Health care services are commonly regionalized, meaning they are grouped together by their physical location or network of service. For pediatric services, regionalization often manifests in the transfer of patients from general hospital EDs, where the supply of specialists and specialty resources is limited, to facilities with comprehensive services that are specialized to care for pediatric patients.² In these situations, pediatric patients are stabilized at the general ED before being transferred to pediatric hospitals. Pediatric health care regionalization is partly the result of an intentional concentration of expertise and resources to a particular location to attain the best patient outcomes. This may occur through economically driven decisions by health care system administrators to efficiently allocate their resources, including personnel and medical equipment.³ Regionalization may also result unintentionally, when factors including patient preferences and informal patterns of physician referrals direct services to certain locations.² Compared to adult health care, pediatric care is highly regionalized. Figure 1 illustrates this difference in terms of the availability and capability of hospital services for pediatric and adult conditions.⁴ Lower levels of chronic or severe pediatric diseases, compared with adult diseases, correspond to lower demand for pediatric care and thus relatively fewer numbers of pediatric health care professionals, many of whom

are concentrated in tertiary care, or specialty children's, hospitals.⁵ In practical terms, there are fewer options for pediatric specialty care at hospitals.

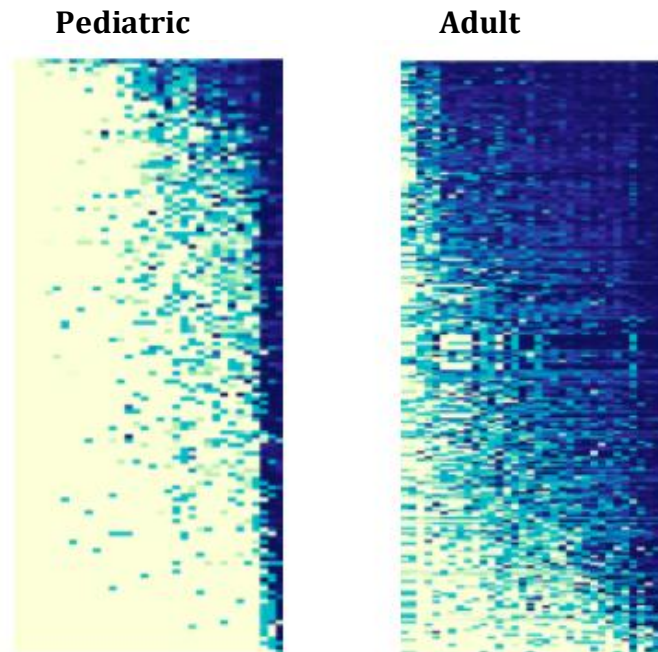


Figure 1: Pediatric and adult condition-specific capabilities of acute care hospitals in Massachusetts. The vertical axis orders 141 conditions by increasing availability of care and the horizontal axis orders 67 hospitals by increasing capability. Each square corresponds to the average probability of care completion, with darker squares indicating higher probabilities.⁴

Additionally, certain government regulations and policies, such as those concerning facility or professional licensing, may restrict the availability of health care services. For example, regulations in Massachusetts stipulate that inpatient care of children under 15 years of age is permitted only in hospitals with licenses for pediatric beds, thus shifting some services out of smaller, community hospitals.⁶ Such regulations aim to uphold standards of care but may prevent rural health care facilities that are unable to maintain licenses due to resource constraints from providing specialty services. On a larger scale, federal policies such as the Integrated Care for Kids (InCK) Model, a novel integrated service delivery model, offer monetary incentives to health care organizations

to improve pediatric health outcomes or reduce health care costs.⁷ Federal policies increase consistency in health care delivery and quality across the country, but are ultimately implemented and operated by participating states. Thus, federal government can drive the formation of regional partnerships among health care facilities and professionals, increasing the regionalization of health care services.

Several studies have begun to characterize the regionalization of pediatric health care over time and their subsequent effects on accessibility to specialty care. In one study by França and McManus, transfers of patients from one hospital to another were examined as a proxy for the transferring hospital's capability and the degree of pediatric care regionalization.⁶ They found that more transfers corresponded to a less clinically capable hospital and more regionalized care. In other words, hospitals that are incapable of caring for certain children, due to lack of clinical personnel, equipment, or hospital beds, transfer them to a hospital with available resources. Considering wait times, changes in settings, and discontinuity of health care providers, transfers profoundly affect children and their family's experience.⁸ Additionally in a study of pediatric intensive care units, patients with a high severity of illness were more likely to have higher mortality when volumes within those units were high than when volumes are low.⁹ Yet pediatric patients with severe illnesses are frequently transferred to large, urban teaching hospitals that have specialized health care professionals, but are more likely to experience greater volumes.¹⁰ In Massachusetts, even common pediatric services for asthma or abdominal pain have decreased in community hospitals and consequently shifted to a handful of academic teaching hospitals.¹¹ The influence of high volume on worse outcomes is thus

compounded with the concentration of pediatric services within a few hospitals that are capable of providing care.

Substantial differences between pediatric care and adult care necessitate distinct considerations in health care financing and in policymaking when the goal is to improve pediatric health outcomes. Hospital admissions for children across four states declined 9.3% while interhospital transfers increased 24.6%, whereas adult admissions remained constant and transfers increased 24.8% between 2006 and 2011.¹² Generally, most hospitals are competent in caring for adults, but fewer and fewer hospitals are as competent in caring for children. The high degree of pediatric care regionalization would make a blanket application of adult standards to pediatric care inappropriate. For example, 46.6% of pediatric specialty hospitalizations would be considered out-of-network under Medicare Advantage network adequacy regulations.¹³ This means that if children's insurance standards were held to those for adults, then children would be paying more than adults in close to half of hospitalizations. Such plans would adversely affect health care accessibility and affordability if implemented for children.

Pediatric Emergency Care Regionalization and Utilization

Pediatric health care regionalization is significant in emergency care. A national survey of hospital EDs found that 39.3% saw less than five children per day and 69.4% saw less than 14 children per day.¹⁴ Most emergency care for children occurs in hospitals that see few pediatric patients and such hospitals dedicate fewer resources for their treatment. In these hospital EDs, the majority of physicians who care for pediatric

patients are trained in family medicine. In contrast, most physicians are trained in emergency medicine or pediatric emergency medicine in hospital EDs that see high volumes of pediatric patients. The authors also found that pediatric emergency care competency evaluations are relatively common for nursing staff but are uncommon for physicians. In addition to professional training, pediatric emergency care expertise is further regionalized by geography and age. In 2020, there were a total of 2,403 pediatric emergency physicians, which is only 5% of all emergency physicians in the US who were clinically active. Analysis of the workforce found that 99% of pediatric emergency physicians worked in urban areas.¹⁵ This observation was consistent with declining pediatric emergency physician density in rural areas over the past decade and the urban locations of specialty children's hospitals.¹⁶ Moreover, the few physicians working in rural areas were older than those in urban areas, suggesting that the imbalanced workforce distribution will worsen in the future as physicians retire. As a result, when children and adolescents present to emergency departments, many are treated by emergency physicians who do not have specialized training in pediatric or emergency care.

Despite the uneven supply and clinical expertise of pediatric emergency care, ED visits by children accounted for nearly one quarter of all ED visits including both adults and children.¹⁷⁻¹⁹ This finding suggests that the number of pediatric emergency physicians are not proportionate to the lower demand for pediatric services compared to adult emergency care. Additionally, there are notable differences between pediatric and general EDs, with most children and adolescents visiting general EDs.^{16,19,15} This

distribution of demand is important to note due to its implications for racial and ethnic minorities. Non-Hispanic Black and Hispanic patients specifically were more likely to be seen in pediatric EDs and to have repeated ED visits in a year that are paid for by Medicaid rather than private payers.^{16,18} Large proportions of payments for ED visits by Medicaid, the government insurer for children and indigent adults, help indicate challenges in accessing medical care in the community.²⁰ When patients are unable to see a primary care physician or afford prescription drugs, morbidities can advance and provoke acute conditions that are more clinically complex and costly than initial presentations. While patient arrival times, as well as rates of screening and diagnostic tests, were similar between the two ED types, more procedures were performed in general EDs.¹⁶ On the other hand in pediatric EDs, patients waited significantly longer to be seen by a physician and had longer lengths of stay. These patients were also more likely to be younger, administered medications used in severe illness, admitted to the hospital, and have a chronic illness. These results suggest that there is a tradeoff between access to pediatric specialty care and patient experience. Patients seen in pediatric EDs often require more complex evaluation and management due to their smaller size and morbidity, but experience delays in receiving treatment. The consequently longer stays in the ED contribute to crowding, which negatively affects the clinical course and experience for all patients who are in the ED.

Pediatric Readiness in the Emergency Department

As a national safety net, EDs typically have personnel and resources including training, equipment, medications, and policies that are capable of caring for serious and complex emergencies. In particular, pediatric patients have physical and psychosocial needs and presentations that are different from adults.²¹ These variations require significantly different clinical considerations in terms of specialists, medication dosing, equipment size, and bedside manner.²² However, fewer pediatric patients compared with adult patients hinder the provision of specialized care since gaining pediatric medical experience is more limited. In 2006, the Institute of Medicine described ongoing deficiencies in emergency medical services settings, including the availability of equipment for pediatric patients, access to supplies and medications, specialized training for staff, and policies in which the unique needs of children and adolescents are incorporated.¹⁷ Low pediatric readiness in EDs translate into poor adherence to clinical guidelines and health care policies, scarce resources for both patients and physicians, and asymmetrical quality of care across different hospitals.² In addition to effects on clinical outcomes, low pediatric readiness can manifest in the forms of overcrowding, “boarding” of patients, and ambulance diversions which directly impact children and adolescents’ access to care.¹⁷

Pediatric Behavioral Health in the ED

Over the past few decades, the US health care system has struggled with a behavioral health crisis.²³ Behavioral health is a broad term that encompasses mental health and substance use disorders.²⁴ While some studies may use terms such as

“psychiatric illness” or “mental health problem” to refer to disorders such as addiction, depression, or suicidal ideation, this thesis will mainly use “behavioral health” as the federal Substance Abuse and Mental Health Services Administration does.²⁴ The reason is to capture all conditions that are not associated with physical, that is “medical” or “surgical,” ailments.

Drivers of the Behavioral Health Crisis

The behavioral health crisis is driven by multifactorial causes, including increases in the demand for behavioral health care and a simultaneous decrease in the supply of inpatient and outpatient services. Changes in societal attitudes towards behavioral health issues, especially the medicalization of some previously stigmatized conditions such as depression and addiction, have increased demand for behavioral health services.²⁵

Although it is more difficult to isolate, true epidemiological increases in the prevalence of behavioral health conditions may also be driving demand higher. For example, public health crises like the opioid epidemic have brought individuals into the patient population.

On the supply side, the availability of behavioral health services in the US have drastically decreased over the past few decades. Deinstitutionalization, or shifts from institution-based care to community-based care, as well as privatization have accompanied government funding cuts and led to declines in the availability of all psychiatric beds in the public sector.²³ In the private sector, unfavorable cost to reimbursement ratios and unpredictable patterns of patient demand have led to a similar

curtailment of inpatient psychiatric beds.²³ Accessing behavioral health care in outpatient settings is also increasingly difficult. A national study found a 0.2% decrease in the number of practicing psychiatrists from 2003 to 2013. To put this slight decrease into the context of other medical professionals, there was a 35.7% increase in neurologists, a 9.5% increase in adult primary care physicians, and overall 14.2% increase in all practicing physicians.²⁶ Additionally in 2012, there were only 8,300 practicing pediatric psychiatrists compared to a projected need of 30,000.²⁷ As a medical specialty, psychiatrists in particular were unevenly distributed across the country, with the vast majority concentrated in the Northeast and the West. These shortages in the supply of behavioral health care has contributed to a behavioral health care crisis.

A further indicator of the insufficient supply of behavioral health care services is its percentage of total health care spending in the US. In 2017, health care spending on mental health, substance use disorder, and prescription drugs combined made up only 5.2% of all health care spending.²⁸ Yet, a study has found that spending on medical and surgical services is two to three times higher for patients who have any behavioral health diagnosis.²⁹ In other words, patients who have a behavioral health co-morbidity have higher complexity or require greater treatment supports and services. This finding suggests that investments to increase the supply of behavioral health services and improve patient access to behavioral health care can reduce total health care spending.

The bottleneck in all psychiatric service availability is exacerbated for the pediatric population by regionalization and pre-existing professional and resource shortages. Over a five-year period, less than half of children's hospitals in the US had an

inpatient psychiatric unit. Hospitals with such a unit still had to transfer 1 in 10 patients for inpatient psychiatric care, confirming findings of low pediatric readiness and hospital capability.^{6,30} Additionally, a study examining the availability of outpatient mental health care in the Blue Cross Blue Shield's commercial insurance network found that outpatient appointments were available for 40% of pediatricians and only 17% of child psychiatrists. Additionally the average wait time for psychiatry appointments was 30 days longer than for pediatric appointments and particularly challenging to access for children insured by Medicaid.¹⁸ Another study using nationally representative data on total health care utilization found that children with special health care needs, that is medically complex or chronic conditions, had approximately 1.5 times more annual visits to EDs than other children.³¹ The higher frequency of ED visits signal both weak coordination by primary care physicians and low access to specialists in the outpatient setting. Children and adolescents suffering from behavioral health conditions in particular are often driven into EDs and even disciplinary centers, where they may deteriorate for days to months without appropriate behavioral health treatment.^{32,33}

In addition to the scarcity of services, a fragmented behavioral health care infrastructure impedes access to services and adherence to treatment. A recent report comparing physical health with addiction and mental health found widening disparities from 2013 to 2017.²⁸ In all five years, out-of-network utilization rates were higher for behavioral health care providers than for medical and surgical providers. In 2017, behavioral health patients were 5.2 times more likely to receive care at an out-of-network inpatient facility, relative to medical and surgical patients. For outpatient care, 17.2% of

office visits to behavioral health professionals were out-of-network, compared with 4.3% for non-behavioral health specialists. Out-of-network utilization is important to monitor and study because it illustrates how behavioral health care is excluded from insurers' networks of care. In practice, patients typically wait longer or pay more for out-of-network services. Again, these disparities in out-of-network utilization are worse for pediatric patients than adult patients. Children were 10.1 times more likely than adults to see a behavior health provider who was out-of-network.²⁸ Another factor that contributes to a weak infrastructure is relatively low reimbursement, or payment, to behavioral health professionals. Reimbursement rates across the US for primary care office visits were 23.8% higher than for behavioral health office visits in 2017.²⁸ In 11 states, reimbursement rates for primary care office visits were over 50% higher than those for behavioral health. This payment disparity reinforces the uneven supply distribution, since psychiatrists are more likely to practice where they are reimbursed at higher rates. The payment disparity also discourages entry into the behavioral health workforce and thwarts existing behavioral health offices from becoming financially stable to hire additional personnel, make technological investments, or physically expand their practice to improve access.

Pediatric Behavioral Health Crisis

The prevalence of behavioral health problems in children and adolescents is concerning. Developmental, behavioral, and mental disorders begin in early childhood, with approximately 1 in 6 children aged 2 to 8 years having a diagnosed disorder.³⁴

Investigating pediatric behavioral health visits to the ED is important because brain development continues into early adulthood and approximately half of all lifetime psychiatric disorders start in adolescence, with some variation in the age of onset depending on the diagnosis.³⁵ A national meta-analysis conducted in 2018 estimated that 1 in 10 youth under 19 years has a serious psychiatric disorder that causes functional impairment.³⁶ Moreover, many serious disorders are typically preceded by less severe disorders that are not appropriately identified and treated. As a major point of access into the health care system, EDs are positioned to screen all children and adolescents for behavioral health conditions. Under EMTALA, EDs are responsible as a safety net for evaluating and managing patients in a non-discriminatory manner and therefore be capable of caring for even patients with behavioral health conditions that are complex and severe, or who are uninsured. Last, mental health and substance abuse disorders are directly related to injury, suicide, and homicide, the top 3 leading causes of death for adolescents aged 15 to 19 years.³⁷ However, less than half of diagnosed youth, even those with three or more disorders, receive any treatment from any health care provider in a given year.^{35,38} Another study showed that many wait more than a decade after a disorder emerges before seeking treatment.³⁹ Moreover, youth who received treatment were often cared for by primary care pediatricians who may not have behavioral health training, rather than behavioral health specialists, and for diagnoses like impulse control disorders instead of depressive disorders. It is important to note that compared to adults, children and adolescents receive behavioral health care services in settings that are not primarily responsible for health.³⁸ While this bolsters overall opportunities to screen for and

identify disorders, facilities such as schools, juvenile detention centers, and human services agencies which are mandated to offer behavioral health services are often under resourced and inadequately trained to care for youth with complex disorders.

Challenges in accessing scarce resources in both inpatient and outpatient settings lead to several scenarios that all drain ED resources and hinder the flow of patients through EDs. On one hand, less acutely ill patients, or those with behavioral health concerns that are not life threatening, visit the ED for lack of available behavioral health professionals in the community or due to inability to navigate the fragmented behavioral health care system. On the other hand, seriously ill patients in crisis such as psychosis or suicidal ideation present to the ED.³² As described above, many of these patients suffer from acute exacerbations of underlying conditions that were not appropriately treated. More timely intervention might reduce the severity or persistence of primary behavioral health disorders, or prevent or delay the onset of secondary behavioral health disorders.³⁵ In general, over half a million youth present to the ED with a mental health problem annually.⁴⁰ Large studies of pediatric EDs across the nation showed that compared with all other patients, behavioral health patients consume more resources, stay in the pediatric ED longer, and are more likely to be admitted to the hospital or transferred to a more capable facility rather than discharged home.^{30,33,41,42} The American Academy of Pediatrics and the American College of Emergency Physicians have jointly acknowledged the growing prevalence of pediatric behavioral health visits to the ED and the significant problems it presents.⁴³

SPECIFIC AIMS

The rising demand for acute behavioral health care over the past few decades poses a grave challenge for treating children and adolescents in EDs across the country. The influx of pediatric behavioral health patients in EDs also places undue collateral strain on emergency medicine providers and all other patients being triaged for medical attention in EDs.⁴² Parallel consolidation of pediatric health care services into a few specialty care facilities such as children's hospitals and generally low supply of specialty trained emergency medicine physicians exacerbates the issue. In this situation, health care policy intervened to complement existing clinical pediatric care, as well as encourage the development and implementation of new clinical best practices. Policymakers took consideration to avoid creating unintended consequences that will further strain overburdened EDs, weaken the behavioral health care infrastructure, or harm patients. This required a multidisciplinary process involving emergency medicine physicians, behavioral health specialists, ancillary health care staff, and stakeholders such as patient families. In other words, health care policy is redefining the care for pediatric behavioral health emergencies and creating value, or a measurable improvement in a patient's health outcomes for the cost of achieving that improvement.⁴⁴

Value-based health care is actually a type of delivery model in which providers including hospitals and physicians are reimbursed according to their patients' outcomes, instead of the volume of services they provide. Value-based care delivery is different from quality improvement efforts, which often build on the ubiquitous fee-for-service system in the US and can focus on administrative efficiency rather than the patient.⁴⁵ Restructuring payment away from fee-for-service, or volume, to outcomes or value, will require substantial knowledge of existing clinical patterns of care, emerging evidence-based best practices, political will, and multi-stakeholder involvement including health care professionals, facilities, and insurers. Drawing from Porter and Teisberg's argument, the US health care system's failure to understand and structure around the needs of pediatric behavioral health patients contributes to a lack of integrated service delivery in EDs.⁴⁴ Consequently, the onus is on families and caregivers to navigate a fragmented system. Figure 2 shows the conceptual steps that policymakers at all levels – health system, state, and federal – should take when designing and implementing value-based care policies that center around patients.⁴⁵ Understanding population health needs is at the core of this framework, and continuous learning or improvement efforts, progress

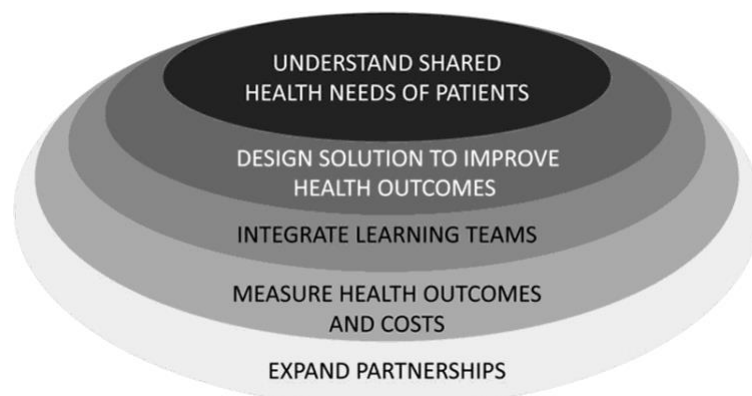


Figure 2: Strategic framework for value-based health care implementation to achieve better patient outcomes.⁴⁵

measurement, and partnerships are recommended for successful implementation of value-based health care policy. Despite the fundamental shifts required, value-based care will help the US health care system achieve the “triple aim” of improving patient experience of care, population health, and health care costs, as well as improving the clinician experience.⁴⁶

This thesis will first describe the epidemiology of pediatric behavioral health visits to EDs in the US. Visit characteristics and trends over time, length of stay, and boarding will be explored to understand the scope of the problem. Drivers of pediatric behavioral health emergencies and limitations in the existing research will be discussed briefly. Then, this thesis will investigate efforts by hospital systems, states, and the federal government to address the increasing prevalence of pediatric behavioral health visits to EDs. This section will describe the optimal care of pediatric behavioral health patients in EDs, current value-based care efforts, and the policy landscape at hospital, state, and federal levels. The conclusion will provide an overview of missing elements and the future direction that health care policy must strive towards to adequately address pediatric behavioral health emergencies.

PEDIATRIC BEHAVIORAL HEALTH EMERGENCIES

Characteristics and Trends

Rising demand for pediatric behavioral health care services in EDs across the country is not a new phenomenon. Over the past few decades, increasing prevalence of ED visits with a primary or secondary diagnosis related to a behavioral health condition has been studied from various perspectives. Studies technically identify such ED visits by behavioral health diagnoses as classified by the International Classification of Diseases, which offers a code for each specific disorder, and using administrative electronic medical records. Researchers commonly refer to the federal Agency for Healthcare Research and Quality's diagnosis groupings under their Clinical Classification Software to bundle together specific codes into groups such as mood (e.g. depression or mania), behavioral problem (e.g. aggression), substance use disorder, self-harm, psychosis, etc.^{42,47} Others have also used the administratively documented chief reason for visiting the ED, or chief complaint, to investigate what brings patients to EDs and discern trends in population health.

A series of studies from the late 1990s to 2021 has compared ED visits by pediatric patients with behavioral health disorders to non-behavioral health disorders. Over this period, researchers agree that the proportion of visits by children and adolescents with behavioral health problems have increased relative to overall pediatric ED visits.^{25,41} One study examining a five-year period of 2012 to 2016 specifically showed that the rate of increase of pediatric behavioral health ED visits was 50.7% whereas the increase in non-behavioral health ED visits was only 12.7%.³⁰ Several

studies have used data from the National Hospital Ambulatory Medical Care Survey (NHAMCS), a nationally representative survey of ED visits at non-institutional, non-federal, general hospitals across the US that is conducted by the National Center for Health Statistics. From 1995 to 2001, mental health diagnoses made up approximately 5% of all ED visits by patients 18 years and under.²⁵ Another study examining ED visits from 2001 to 2008 found that children aged 6 to 13 years made up 1.4% of mental health visits to EDs and adolescents aged 14 to 18 years made up 4.7% of visits.³³ More recently, Pittsenbarger and Mannix showed that pediatric mental health ED visits increased from an estimated 491,000 in 2001 to 619,000 in 2010 and accounted for approximately 2% of all ED visits by pediatric patients annually.⁴⁸ Investigators alternatively use data from the Pediatric Health Information System (PHIS), which reports administrative data such as demographic characteristics, billing information, procedures, and diagnoses from 49 tertiary care children's hospitals in the US. Figure 3 illustrates increased rates of visits with mental health diagnoses across five census regions, with a 40% increase nationally from 9.3 visits per 1000 in 2009 to 13.7 visits per 1000 in 2013.⁴⁹ The Midwest region in particular showed a marked rise in behavioral health-related visits to pediatric EDs. The authors also found that over the same period, overall pediatric ED visitation rates for asthma, a common pediatric diagnosis, decreased. This further suggests that ED visits for behavioral health emergencies have increased disproportionately when compared to other chronic, pediatric diseases. Notably, these studies relying on administrative databases likely underestimate the prevalence of ED

visits for behavioral health conditions because many ED providers do not actively screen all patients for mental health and substance use issues.⁴³ For example, a patient might have a trauma-related diagnosis after suffering a motor vehicle accident that was actually secondary to substance use.

A study conducted at Oregon Health and Science University’s hospital found that while overall patient volume in their pediatric ED increased from 2009 to 2013, there was also a statistically significant increase in the proportion of pediatric mental health diagnoses to all pediatric diagnoses, from 1.1% to 1.7%.⁵⁰ The same study revealed that 12% of unique patients seen at the pediatric ED were patients with repeat visits for a behavioral health issue. A separate study at Boston Children’s Hospital similarly revealed that the rate of mental health visits with a prior mental health ED visit within 1 year increased from 22.6% in 2010 to 26.4% in 2016, or 4% annually.⁵¹ Pediatric patients with

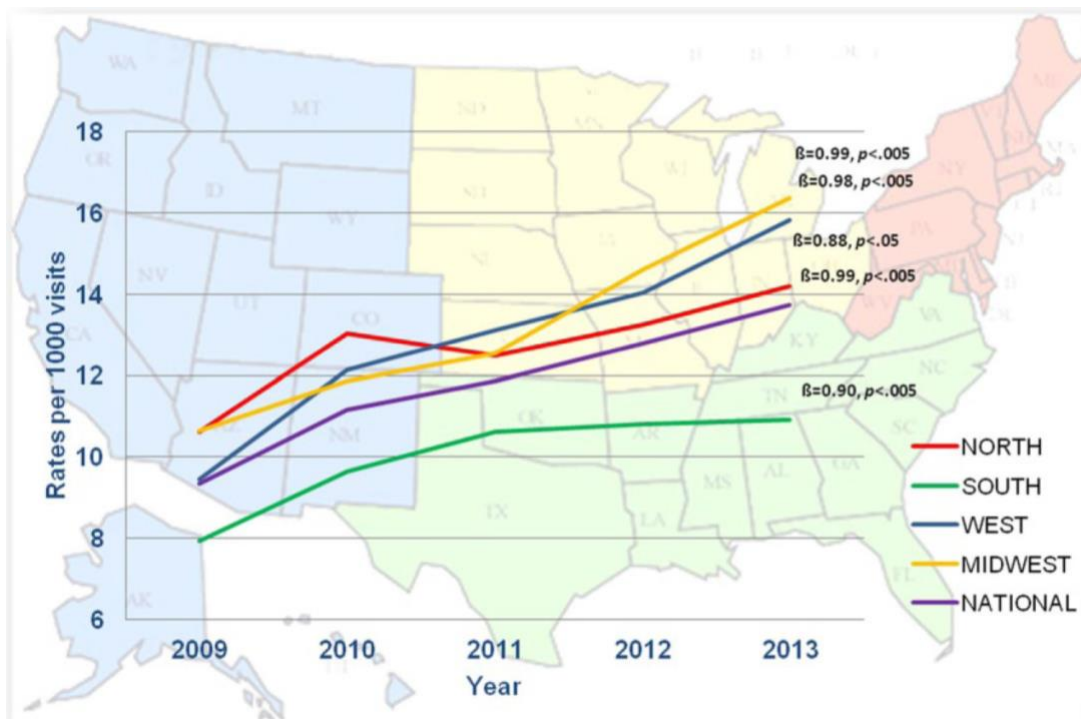


Figure 3: Rates of pediatric behavioral health visits at pediatric EDs.⁴⁹

behavioral health conditions are not only growing in proportion to patients with other conditions, but also increasingly returning to EDs, signaling inadequate follow-up in outpatient settings even after an identified behavioral health crisis.

There are important patterns in the age and sex of patients presenting to EDs. Multiple studies have found higher ED utilization for behavioral health conditions by adolescents aged 14 to 18 years than by children 13 years and under.^{52,33,48,47} Adolescents were more likely than children to present to EDs with a psychiatric diagnosis and this probability increased over time while there was no significant change for children. Similarly to adolescents, young adults aged 18 to 24 years were also more likely than children to have psychiatric-related ED visits.⁴⁷ However, adolescents were more likely than young adults to be Hispanic, have a more urgent visit, see a mental health provider, and be transferred or admitted to a psychiatric facility instead of discharged home. Adolescents were also more likely to have a primary psychiatric diagnosis, along with multiple secondary diagnoses, related to mood, behavioral, or suicidal disorders. Both children and adolescents were less likely to arrive to the ED by ambulance or have a substance use disorder, and more likely to present to EDs in the evening. These findings agree that adolescents have urgent behavioral health needs and suggest important considerations for policymakers and emergency medicine professionals to design age-specific interventions. As for associations between patient sex and behavioral health visits to EDs, one study found no difference between males and females in population rates of pediatric behavioral health visits to EDs.³³ However, interactions between age, sex assigned at birth, and diagnosis quickly become complex. One study found higher

prevalence of major depressive disorder in adolescent females than males, while a recent study including young adults found that males were more likely to visit EDs.^{53,47} In the more recent study, the authors' inclusion of young adults, who had higher rates of visits related to substance use, might have generated this conflicting finding. In general, male patients were more likely to seek emergency care for substance use and psychosis, and to be younger than female patients. Interestingly, the authors showed a significant time trend for female patients, with a rising ED visit rate by female patients. A more recent study found that pediatric behavioral health patients in EDs were more likely to be female.³⁰ Conflicting sex-related findings support the need for non-discriminatory care for all patients who present to EDs so that neither sex is ignored.

A patient's race and ethnicity are additional characteristics that are studied to promote health equity and minimize disparities in the acute care setting. Population rates of behavioral health ED visits from 2001 to 2008 were similar between White and Black pediatric patients.³³ During this time period, behavioral health ED visits were less frequent among younger, Black, Hispanic, and publicly insured patients. A more recent study found that Black patients had fewer urgent or substance use-related ED visits.⁴⁷ Several studies have consistently identified Hispanic patients as a population that might not be receiving adequate treatment for behavioral health disorders. Specifically, Hispanic patients had lower rates of behavioral health ED visits than non-Hispanic patients, and those ED visits were more likely paid for by Medicaid or self-pay than private insurance.^{33,48} Because these studies were correlational, the cause for less frequent behavioral health ED visits is unclear. The prevalence of behavioral health conditions

might actually be lower among Hispanic patients, however barriers including cultural beliefs and awareness of behavioral health care, patterns in seeking medical attention, and ability to navigate the health care system may be limiting ED utilization. Additionally, pediatric patients who are publicly insured by Medicaid or have no insurance, as opposed to private insurance, have a four times higher risk of visiting EDs for behavioral health issues.⁴⁸ From 2011 to 2015, there was no observed change in the odds of a behavioral health ED visits among White patients, but there were significant increases among Black and Hispanic patients by 53% and 91%, respectively.⁴⁷ Implementation of state Medicaid expansions under the Affordable Care Act (ACA) enacted in 2010 may be partly responsible for widening disparities in the odds of a behavioral health ED visit and race, ethnicity, and source of payment. The increasing number of visits can be positive if patients who were previously excluded from health care services by cost barriers began seeking medical attention in EDs after they obtained public insurance. A final note about insurance is that national studies are challenging since approximately 40% of children in the US are insured by Medicaid, which is largely run by states instead of the federal government.²⁰ Therefore, there is variation among states in eligibility and reimbursement rules that can contribute to differences in patient populations and require policymakers to draw conclusions judiciously.

Trends in the clinical presentations of pediatric behavioral health visits to ED have also been monitored to understand population health needs and improve the readiness of EDs. Earlier studies up to 2013 found that these visits are more likely than non-behavioral health visits to arrive to EDs by ambulance or a public service such as

police or social services.^{33,52} More recently and depending on the hospital's location, more than half of pediatric behavioral health patients arrived to EDs by private car and approximately one-third of patients arrived by ambulance.⁵⁰ Shifting means of arrival are important for hospitals to note because emergency medical services typically provide some stabilizing treatment during ambulance transport to EDs. This has implications for the flow of patients through EDs, funding areas, and education and training needs of emergency medicine personnel. Next, the primary diagnosis for pediatric behavioral health ED visits varies depending on how investigators categorize the specific conditions that are documented in a patient's electronic medical record. Mood disorders including anxiety and depression are common diagnoses, followed by disruptive behavioral or attention deficit hyperactivity disorders, substance use such as alcohol abuse, personality disorders, and psychotic disorders like schizophrenia.^{33,48,50,54} Three recent studies identified a marked rise in the number of pediatric ED patients diagnosed with a depressive disorder, self-injury or suicide, and trauma-related disorders, for as high as an 8 fold cumulative increase over non-behavioral health ED patients.^{42,30,47} A 2.5 fold increase in self-injury and suicide-related visits specifically was observed among adolescents from 2011 to 2015. This trend is especially concerning since only 16% of patients were seen by a mental health professional during their stay in the ED.⁴⁷ Given the rising urgency of visits, one would expect a larger proportion of care in the ED provided by a pediatric behavioral health specialist. The contrary reality reflects issues that were introduced earlier in this thesis, including pediatric emergency care

regionalization and ED readiness, which diminish and fragment the supply of pediatric behavioral health services.

Additionally, despite no significant difference in medical complexity between behavioral health and non-behavioral health patients, all patients presenting to EDs with a primary complaint related to behavioral health require medical clearance.³⁰ Medical clearance refers to a process whereby emergency medicine physicians screen for undetected or unidentified medical diseases or injuries, as well as exclude potential medical conditions that may be causing or worsening psychiatric symptoms.⁴³ One investigation showed that more than half of pediatric behavioral health patients underwent laboratory testing, most commonly to examine electrolyte levels. The investigation also showed that almost half of patients had urine, blood alcohol content, and complete blood count tests.⁵⁰ This has significant implications for the use of ED resources, since unfortunately, not all pediatric patients receive behavioral health screenings in the ED which are typically questionnaires. On the other hand, behavioral health ED visits receive fewer imaging studies and medical procedures.³³ Interestingly, children and adolescents presenting to EDs with comorbid behavioral health and medical issues have shorter stays in the ED despite the added complexity.⁵⁵ This is because their medical issues, such as poisoning or self-harm injury, require immediate admission to the hospital's medical unit. Over time, patients with only a behavioral health diagnosis, or prior behavioral health diagnoses or admissions, were increasingly likely to visit EDs and have longer stays.^{56,55} Issues and implications of prolonged lengths of stay will be explored in detail in the following section.

Although this thesis focuses on what occurs within the ED, the discharge disposition of patients will be briefly discussed. Knowing where patients go after their ED visit contributes to a greater understanding of what happens during their ED stay and the overall flow of patients through EDs. As described above, patients visiting EDs with behavioral health concerns are more likely to be admitted to the hospital or transferred to a specialty facility than patients visiting with non-behavioral health concerns. In hospitals with an inpatient psychiatric unit, generally those that are larger in size, pediatric behavioral health ED patients were more likely to be admitted and less likely to be transferred than in hospitals without an inpatient psychiatric unit.³⁰ Regardless of the presence of an inpatient psychiatric unit, however, hospital EDs experienced higher pediatric behavioral health visit frequency. Additional comparisons between hospitals with and without a psychiatric unit showed that patients visiting EDs with depressive disorders were nearly 3 times more likely to be admitted and those with disruptive, conduct, and impulse control disorders were 2 times more likely to be admitted in hospitals with an inpatient psychiatric unit.³⁰ These findings imply more timely behavioral health treatment and a greater likelihood of care continuity in hospitals with embedded psychiatric expertise. .

Key Issues Associated with Pediatric Behavioral Health ED Visits

Prolonged ED Length of Stay

Compared to non-behavioral health ED visits, pediatric behavioral health ED visits are longer, more urgent, and more likely to require medical and behavioral health care beyond the ED visit. Studies have identified various lengths of stay in the ED depending on the data source, study period, and sample inclusion criteria. As early as in 1997, behavioral health patients stayed in pediatric EDs for a median of 4.75 hours, which was more than double the length of stay for all other pediatric patients.⁵⁷ A more recent study found that the median length of stay for pediatric behavioral health ED visits across the country was 2.82 hours, which is significantly longer than other visits by 61 minutes.³³

At one urban hospital, the average length of stay for pediatric behavioral health ED visits was 11 hours, with a significant increase in average duration from 6.7 hours in



Figure 4: Mental health visits at a tertiary children's hospital from 2010 to 2016, stratified by length of stay.⁵¹

2009 to 20.8 hours in 2013.⁵⁰ A second urban children’s hospital showed similar increasing durations of ED visits, with stays greater than 24 hours accounting for 4.3% of visits in 2010 but 18.8% of visits in 2016. Figure 4 illustrates that hospital’s increasing amount and duration of behavioral health ED visits from 2010 to 2016.⁵¹ Not shown are visits with lengths of stay greater than 48 hours, which made up 0.1% of behavioral health ED visits in 2010 but increased to 6.4% of visits in 2016. Most recently, a nationally representative study of pediatric behavioral health ED visits from 2005 to 2015 affirmed the increasing rates of prolonged lengths of stay. Figure 5 compares mental health ED visits with non-mental health ED visits among patients aged 6 to 17 years.⁵⁵ Although the length of stay in EDs increased, the proportion of mental health visits that resulted in admission or transfer remained constant over the study period.⁵⁵ Since patients’ ED disposition patterns did not change, a likely cause for longer ED stays is the decreasing supply in behavioral health care services both within and outside of EDs, rather than increasing severity of visits. Another possible explanation is changing ED protocols that have decreased efficiency and throughput but have not affected clinical

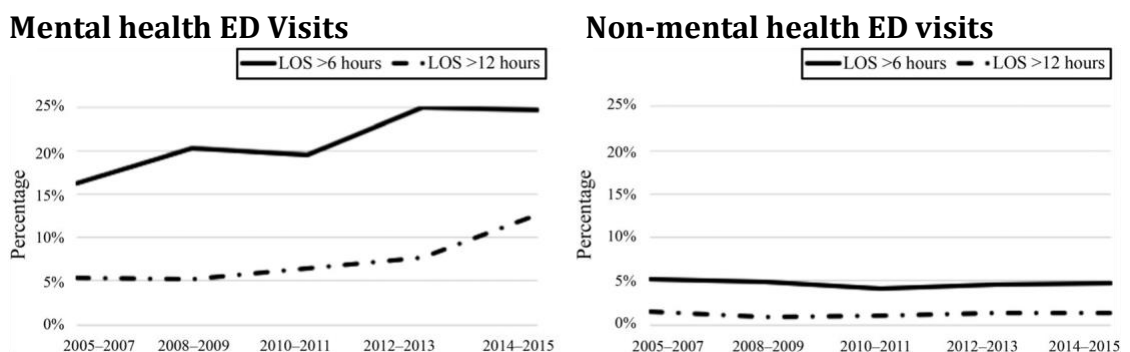


Figure 5: Rates of prolonged length of stay (LOS) across the US for pediatric mental health ED visits and non-mental health ED visits from 2005 to 2015.⁵ For mental health ED visits, rates for LOS >6 hours increased from 16.3% to 24.6% and rates for LOS >12 hours increased from 5.3% to 12.7%. For non-mental health ED visits, both LOS >6 hours and >12 hours remained stable at approximately 4.8% and 1.2% respectively.

care. Similar to the previous discussion in this thesis about visit prevalence, Hispanic patients had nearly 3 times greater odds of ED stays that are longer than 12 hours.⁵⁵

Notwithstanding the median or average lengths of stay, children and adolescents seeking acute care for behavioral health conditions are 2 times more likely to stay in the ED for more than 4 hours compared with non-behavioral health patients.³³ Longer lengths of stay do not necessarily suggest higher medical severity or longer evaluations by physicians or other health care personnel.⁵⁸ Much of the visit is occupied by waiting for limited resources including behavioral health specialists, social workers, or care coordinators, and alternatively waiting for diagnostic laboratory test results, inpatient beds, or transfer transportation services to become available. Furthermore, prolonged ED stays can be associated with clinical risks for patients, as well as added administrative and safety monitoring costs for hospitals.

Several factors help predict the duration of ED visits. Patients in hospitals that have an inpatient psychiatric unit tend to experience shorter stays in the ED, although they also have higher admission rates.⁵⁴ Conversely, hospitals with relatively long ED visits have much lower rates of admission and transfer.⁵⁰ One possible explanation is that patients who were experiencing an acute behavioral health crisis stabilize during their prolonged stay and subsequently are discharged home with follow-up care plans in the outpatient setting. Although patients must be medically cleared for discharge, such care patterns are not beneficial for their behavioral health in the long term, as increasing rates of repeat ED visits for behavioral health emergencies suggest.⁵¹ In 2011, Case et al. identified several characteristics that predict longer stays in the ED, namely age 6 to 13

years, diagnoses related to intentional self-injury, laboratory tests, and transfer dispositions.³³ Hospital-specific patterns of laboratory testing and transfers help explain regional variation in ED length of stay and affirm uneven ED readiness for pediatric behavioral health patients. Interestingly, most ED visit diagnoses had no influence on patients' length of stay. Finally, declining pediatric behavioral health provider participation in private insurance lead to more narrow networks.³³ This would slow down the discharge of patients to outpatient care since more narrow networks means that there are fewer options for emergency medicine physicians to coordinate follow-up care with. As discussed earlier, pediatric patients end up receiving out-of-network behavioral health services and paying for the additional costs.²⁸

In summary, multiple studies agree that patients are experiencing increasingly prolonged ED stays, implying that the role of the ED as a provider of behavioral health services is becoming more critical. Currently however, the lack of privacy, personnel shift changes that cause loss of care continuity, and abundance of activities that induce light and noise in the ED are not suitable for pediatric behavioral health patients to recover and can promote agitation. As a result, longer stays are positively correlated with the use of physical and pharmacological restraints.⁵¹ Studies have found that physical restraints were typically ordered after 4 hours and pharmacological restraints were ordered after 5 hours in the ED.^{50,54} Longer ED stays are also associated with higher charges since the longer the patient stays in the ED, the likelihood of using additional resources increases.

Boarding of Patients in the ED

A second key issue associated with pediatric behavioral health ED visits is boarding, in which a patient waits in the ED for an inpatient psychiatric bed.⁵⁹ Boarding is closely tied to length of stay, but refers to a more narrow span of time in which the patient has been evaluated by an emergency medicine physician and is not being actively evaluated or treated for medical or behavioral health conditions. In other words, the patient is stuck in the ED. A picture of boarding commonly entails a patient waiting in a bed or even a chair in an ED hallway or waiting room. One study found that approximately one third of ED visits requiring psychiatric admission at an urban children's hospital were boarded for an average of nearly 1 day.⁵⁹ The study also showed that age, race, insurance status, and behavioral health evaluator (hospital clinician versus mobile crisis team clinician) had no relationship to boarding. In contrast to lengths of stay, certain diagnoses did increase the likelihood of boarding. These include autism spectrum disorder, developmental delay, and especially suicidal ideation.

A particularly important predictor of boarding is the timing of the visit, or when the patient arrives at the ED. Evening, overnight, and weekend arrivals were more likely to experience boarding for several reasons. First, hospitals usually have less coverage by behavioral health specialists during these times because of their scarcity. There are also less personnel available overall in hospitals, especially attending physicians who have authority to make final disposition decisions. Next, beds in inpatient psychiatric units usually become available when hospitalized patients are discharged during regular business hours. Last, some patients may have insurance that require pre-certification for

hospitalizations but are not reachable in the evenings, overnight, or during weekends. Another finding that is significant for children and adolescents is that presentation to EDs during months when school is in session is associated with higher chances of boarding. These barriers demonstrate that the health care system is not structured around the needs of patients, particularly those who urgently seek care for a behavioral health emergency. Loss of school days and loss of parent or caregivers' workdays are just some collateral harms that result from ED boarding. Finally, 94% of pediatric patients with a behavioral health condition were admitted from a pediatric ED to a general medical unit for boarding, rather than out of medical necessity.⁶⁰ This study also found that only 6% of pediatric behavioral health patients received any type of behavioral health counseling while they were boarded and only 20% received psychiatric medications.

The limited supply of inpatient beds in hospital psychiatric units or separate psychiatric facilities can enable unethical admitting practices. One study uses terms like "reverse triage" and "cherry picking" to describe the phenomenon when facilities are selective of the patients they admit.⁵⁹ When there are more boarded patients than available beds, facilities may select patients with less acute conditions who will present with the least complications during their hospitalizations. These patients are not expected to require extensive medical care, behavioral health counseling, or nursing attention beyond what is readily available within the inpatient unit, nor are they expected to be hospitalized for a long period of time. In contrast, patients who are more seriously ill, such as those having suicidal ideation and arguably needing more immediate attention, remain boarded and endure longer stays in the ED.

Another issue that is associated with increasing visit frequency, length of stay, and boarding of pediatric behavioral health patients in the ED is obstruction of the throughput of patients through the ED. While the ED is not even the most appropriate setting for behavioral health care emergencies and minimal treatment is actually provided to patients during their visit, these patients are still using some ED resources that can be better served in the care of other patients. Additionally, most hospitals in the US are reimbursed on a fee-for-service basis instead of by time or clinical outcome. Patients with prolonged ED stays therefore affect hospital revenue when they occupy beds that otherwise see quick patient turnovers but are not actively undergoing evaluation or receiving treatment. This can be especially challenging for rural general hospitals that have fewer resources and are less financially stable compared to urban children's hospitals that have higher patient volumes. When a pediatric patient occupies a space for an extended length of time in a low volume rural hospital, that hospital absorbs the opportunity cost. Ideally, value-based care policies would reimburse hospitals for patient outcomes, after accounting for factors including the quality of care and rates of readmission, hospital-acquired illness or safety events. Value-based care would help discourage hospitals from "cherry picking" boarded patients and provide incentive to reduce long lengths of stay and boarding, which have been associated with repeat visits to the ED.⁵¹

Economic Impact of Rising Pediatric

Behavioral Health Visits to the ED

There are important economic costs associated with rising pediatric behavioral health visits to the ED, in addition to the impact on clinical care. An observational study of tertiary children’s hospitals from 2005 to 2014 found a 41.5% increase in the number of all hospitalizations, 25.7% increase in days stayed in the hospital, and 40.8% increase in hospital costs for all patients.⁴²

Figure 6 shows 3 graphs which break down these overall trends into patients with a psychiatric diagnosis and patients without a psychiatric

diagnosis.⁴² Hospitalizations

associated with a psychiatric

diagnosis accounted for 18.3% of total hospitalizations and increased by over 5 times more than hospitalizations without a psychiatric diagnosis. Costs for behavioral health hospitalizations grew significantly from \$671 million in 2005 to \$1.6 billion in 2014.

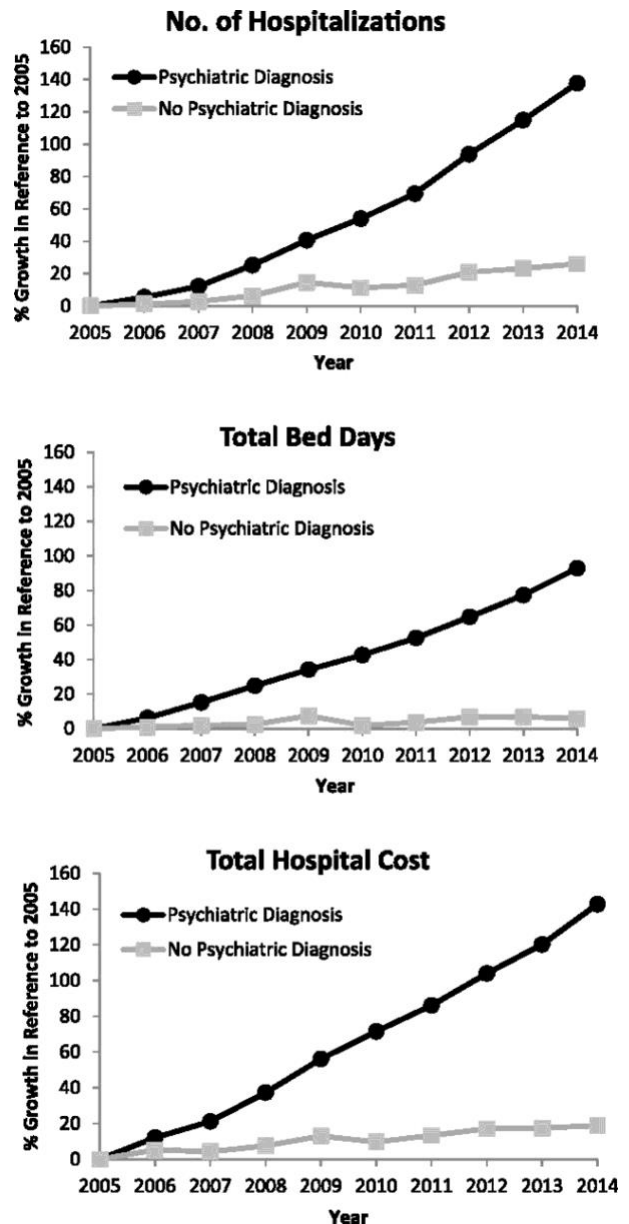


Figure 6: Hospital resource utilization for pediatric patients with and without a psychiatric diagnosis from 2005 to 2014.⁴²

Over three quarters of these behavioral health hospitalizations were associated with a concurrent medical diagnosis and a mere 5.7% of the hospitalizations had only a psychiatric diagnosis.⁴² These findings suggest that behavioral health conditions raise the severity or complexity of admissions, leading to more frequent, longer and more costly hospitalizations. To ensure high quality care delivery, health care professionals work in multidisciplinary teams, or coordinate care across specialties and sectors, to deliver the mixture of medical and behavioral health services that most hospitalized patients require. Policymakers can encourage collaboration in several ways, including by supporting electronic medical record systems that ease data sharing, developing programs that incorporate different types of health care providers, or bundling payments for a patient's entire episode of care instead of reimbursing on a fee-for-service basis.

More specifically, ED resource utilization by pediatric behavioral health patients increased over time. A study from 2011 to 2016 at one children's hospital found that the median cost per ED visit incurred by pediatric behavioral health patients increased from \$642 to \$1,317.⁵¹ This was significantly greater for behavioral health ED visits than among non-behavioral health ED visits. Itemized ED charges that contributed to rising costs include arrivals by ambulance, laboratory testing, and nursing care that correspond with prolonged lengths of stay.⁵⁰ As mentioned earlier, medical clearance of pediatric behavioral health patients in the ED is standard operating procedure, even when the patients do not present with any somatic symptoms. However, it is unclear whether the laboratory tests yield a diagnostic or therapeutic return on investment. A study discovered that 44% of behavioral health patients who were medically indicated for laboratory

testing had abnormal results, but only 5.4% required an intervention. Furthermore, only 9% of behavioral health patients who underwent laboratory testing for non-medical, procedural purposes (admission or transfer) had abnormal results, and none required any interventions.⁵⁷ Although the clinical value of tests for pediatric behavioral health patients is questionable and longer term studies are necessary, testing is still commonplace and costly. Another itemized ED charge that is unique to pediatric behavioral health patients is safety monitoring. About half of patients at one urban pediatric ED required monitoring by hospital-employed safety officers, most frequently to prevent patients from wandering or leaving the ED without supervision or prior approval.⁵⁷ Other monitoring costs include extra nursing coverage, physical restraints, and pharmacological sedative medications to prevent self-harm, harm to ED staff, or damage to the facility.

Exacerbation of the Pediatric Behavioral Health Crisis by COVID-19

Emerging studies have already demonstrated that the COVID-19 pandemic has exacerbated the ongoing behavioral health crisis in the US. The federal Centers for Medicare and Medicaid Services released data showing that between March and October 2020, individuals in the US have missed millions of primary, preventive, and mental health care visits, compared with the same period in 2019.⁶¹ Among adults, especially those aged 18 to 29 years, having a household income of less than \$35,000 per year, and Hispanic adults, psychological distress and loneliness increased significantly just one month after COVID-19 was declared a national emergency by the federal government.⁶²

There was a 22% overall decline in mental health care utilization, or approximately 12 million fewer services received, by adults aged 19 to 64 years. Mental health services also exhibited the slowest rebound to pre-pandemic levels. Following patterns of pediatric health care regionalization that was described earlier in this thesis, there was a comparatively larger 34% decline in the utilization of mental health services, or approximately 14 million fewer services, for pediatric patients 18 years and under.⁶¹ Furthermore, Krass et al. showed that the proportion of ED visits for behavioral health

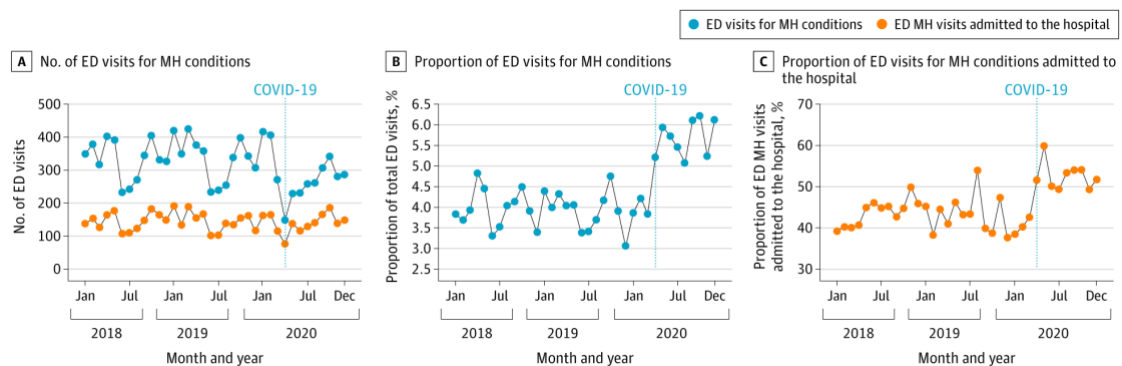


Figure 7: Pediatric ED visits and admissions for mental health (MH) conditions from 2018 to 2020. Graph A compares the number of ED visits for MH conditions with the number of ED visits for MH conditions that resulted in admission. Graph B illustrates how the proportion of ED visits for MH conditions increased from 4.0% to 5.7%. Graph C depicts the proportion of ED visits for MH conditions that resulted in admission increasing from 42.9% to 52.7%.⁶³

conditions by children and adolescents increased significantly at one tertiary children’s hospital.⁶³ Figure 7 from their study shows how the frequency and proportion of ED visits for pediatric mental health conditions were affected after COVID-19 was declared a national emergency.⁶³ The number of ED visits decreased because access to hospitals became severely restricted and people had concerns about exposure to COVID-19 in EDs. However, figure 7 also shows the impact that COVID-19 had on ED visits resulting in admissions, namely, admissions spiked and did not return to pre-pandemic levels. This is very concerning because it suggests that emergency medicine physicians and

behavioral health patients did not feel comfortable with home discharges even after the initial period of severely restricted access to most health care services passed. A possible explanation is the sustained loss of outpatient behavioral health care offices, which survived on relatively low reimbursement rates, and thus opportunities for follow-up. In other words, COVID-19 has exacerbated prior trends in ED visit frequency and length of stay. When more data become available, additional studies are needed to determine the lasting effects on pediatric behavioral health visits to the ED. It will be interesting to see what will be required for the behavioral health care system to restructure and to do so surrounding the needs of pediatric patients.

Drivers of Pediatric Behavioral Health Visits to the ED

Earlier in this thesis, demand, supply, and structural factors contributing to the emergence of a behavioral health crisis were discussed. Similar factors appear to drive pediatric behavioral health patients to visit the ED instead of a psychiatrist's office in the community. First, a rise in the incidence, or number of new cases each year, of behavioral health conditions can lead to changes in the epidemiology of behavioral health disorders in the pediatric population. At the same time, the dwindling supply of pediatric psychiatrists, other pediatric behavioral health specialists, and psychiatric facilities limits the timely identification and management of behavioral health disorders.³² Cross-disciplinary training of primary care physicians in pediatric psychiatry is also limited, resulting in a lack of diagnostic and therapeutic insight that allow disorders to remain undetected or untreated in children. Similarly, hospitals have reported inadequate funding for pediatric training and educational resources for their staff.¹⁴ A corollary to

epidemiological change is the advancing complexity of pediatric behavioral health conditions. In this line of thinking, a relatively constant number of patients carry a greater burden of disease, experiencing more acute events that require attention from emergency medicine physicians.

There are manifold reasons for more frequent visits to the ED. One cause of higher demand is the prescribing of new medications that come with the risk of psychosomatic side effects.⁶⁴ Another explanation is that ACA-associated Medicaid expansion and other federal health care policies like EMTALA improved patients' access to EDs, but not outpatient behavioral health care. Alternatively, societal changes affecting childhood and adolescence, greater awareness and medicalization of behavioral health disorders, improved diagnostic capabilities, and reduced stigma associated with seeking help for mental health and substance use problems increased the prevalence of behavioral health ED visits.

Limitations in Research

Despite the extensive research surrounding pediatric behavioral health visits to EDs, there are two major limitations: determining clinical needs and analyzing root causes. First, research suggests that there are unmet behavioral health needs among pediatric patients, but determining the scope remains difficult. This is partly due to challenges in making valid psychiatric diagnoses, especially in the ED setting. Application of diagnostic criteria or behavioral health assessments vary with pediatric ED readiness, depending on the implementation of behavioral health training and availability of behavioral health specialists, or even from provider to provider.¹⁷ In addition to the

lack of diagnostic and procedural concordance across EDs, little agreement on the study population leads to varying conclusions that can, in turn, contribute to mixed guidelines. Specifically, age ranges fluctuate, with many researchers studying patients up to and including 18 years while others select another age, such as 21 years. Although 18 years is the most common age of majority after which individuals can give legal consent in the US, other ages are also important in health care. The ACA required insurers to make dependent child coverage available to policy holders until the child reaches 26 years of age and state Medicaid programs have differing eligible age cutoffs. Another example was given earlier, in which the state of Massachusetts stipulates that hospitals are permitted to provide inpatient care for patients under 15 years only if they are licensed for pediatric beds. These variations have significant implications for health care access and affordability. Finally, behavioral health disorders can present differently depending on age and individuals aged 18 to 29 years have higher odds having a disorder.³⁵ Studies that narrowly define the age of their study sample may not be picking up on all patterns in ED visits. The lack of agreement surrounding the study population restricts the generalizability of findings.

Reliance on administrative databases also contribute to difficulty in determining the clinical needs of pediatric behavioral health patients. Although administrative databases offer advantages to pediatric researchers including large sample size, minimal expense, regular updates, and less bias than surveys, there are also some distinct disadvantages. One major consideration is that administrative databases such as the NHAMCS or PHIS collect data on the level of visits or encounters, instead of individual

patients. For example, if an adolescent patient returns to the ED within a few days of an index ED visit, then these databases record the two visits and not one patient. Because a single patient can contribute more than one record, administrative databases tend to collect data that capture a better picture of hospital resource utilization than a patient's clinical course. It is difficult to determine whether prior ED visits or hospitalizations impact subsequent encounters or longer-term health outcomes. A second consideration is coding variation over time or across EDs and even emergency medicine providers. Variation can arise when a new code is added to the medical record system or administrative database, or when a hospital implements a new documentation protocol.⁴² Coding variation can also be missing documentation for a visit's urgency, patient's race, or insurance type if a provider fails to ask or input these data into the electronic medical record.⁴⁷ The third consideration when using administrative databases is that standard coding procedures occlude insights into the clinical course of a patient. Some records count admissions, but do not distinguish between admissions to medical or psychiatric bed, while other records count transfer dispositions but do not identify transfer arrivals. Administrative databases similarly count psychiatric consultations, but do not capture the specific nature of interactions between pediatric patients and emergency medicine or behavioral health providers. Some interactions that involve trust building or patient and family education, are not documented but can be valuable for patient care. It is also challenging to pinpoint the rate-limiting step in a patient's ED visit that contributed to prolonged lengths of stay. For example, a patient can be waiting on several things including their laboratory tests results, the behavioral health consultation, or an inpatient

bed, and the rate-limiting step can be different for different EDs, depending on that hospital's readiness.¹⁹ In summary, challenges in making valid diagnoses in the ED setting and reliance on administrative databases make it challenging for researchers to determine the clinical needs of pediatric behavioral health patients.

The second major limitation in existing research is the ability to analyze root causes for pediatric behavioral health ED visits. In this thesis, multiple drivers including the decreased supply of outpatient behavioral health care and increased epidemiological demand (in terms of prevalence, morbidity, awareness, and diagnosis) were discussed. However, the proportion that each driver contributes and its exact role are unclear.^{30,47,48} This recalls the discussion of administrative databases that are used in cross-sectional, retrospective, and observational studies. These study designs yield correlational, not causative, results. Investigations using experimental designs are challenging or impossible to administer for this issue and patient population, however intervention-based and prospective research on pre-defined patient cohorts can add knowledge about pediatric behavioral health visits to EDs.

PEDIATRIC, EMERGENCY, AND BEHAVIORAL HEALTH CARE POLICIES

As a national safety net and major point of entry into the health care system, hospital EDs are positioned to provide critically important care for children and adolescents who are in urgent need of behavioral health care services. However, EDs require relief from crowding, long wait times, and boarding which impact all patients' experience and health outcomes, while exhausting hospital personnel and resources. Evidence-based policies intervene to introduce systemwide reforms that can meet patient needs while supporting health care professionals and facilities. The American College of Emergency Physicians put forth action items that would help EDs achieve desirable outcomes for pediatric behavioral health visits.⁶⁵ Broadly, they include pediatric behavioral health care training for all staff in the ED, appropriate reimbursement for pediatric behavioral health care services, partnerships with psychiatric facilities, support for pediatric primary care, promotion of patient and family education in mental health emergencies, and advocacy for pediatric mental health resources, comprehensive insurance coverage, patient-centered behavioral health services in the community, and research funding. The implementation of these action items requires multi-stakeholder involvement, progress measurement, and continuous learning efforts.

Value-based Care Delivery

Value-based care was defined earlier in this thesis as a type of health care delivery model in which providers are paid according to their patients' outcomes instead of the quantity of services they provide. The American Psychiatric Association identified integrated care, or blended delivery of behavioral health services with medical services,

as a key method for achieving the triple aim of improving patient and population health, while reducing health care costs.⁶⁶ The Collaborative Care Model is one type of value-based care delivery model that integrates services in order to improve patients' access and adherence to behavioral health treatment. It is proposed as a key solution for the pediatric behavioral health care crisis due to its demonstrated clinical effectiveness in the treatment of patients with depression in randomized control trials.⁶⁷ Moreover, the Collaborative Care Model follows value-based care principles by drawing from evidence, focusing on population needs, measuring outcomes, and delivering care in teams. Figure 8 shows how a multidisciplinary team consisting of a primary care provider, behavioral health care manager, and psychiatric consultant is structured around the patient and assume shared accountability for health outcomes.⁶⁶ As noted by arrows with dotted lines, the psychiatric consultant, a limited resource, maintains infrequent contact with the patient and primary care

provider. However, the consultant regularly documents in a shared data registry to maintain communication with the behavioral health manager. This team structure allows the low supply of psychiatric specialists to

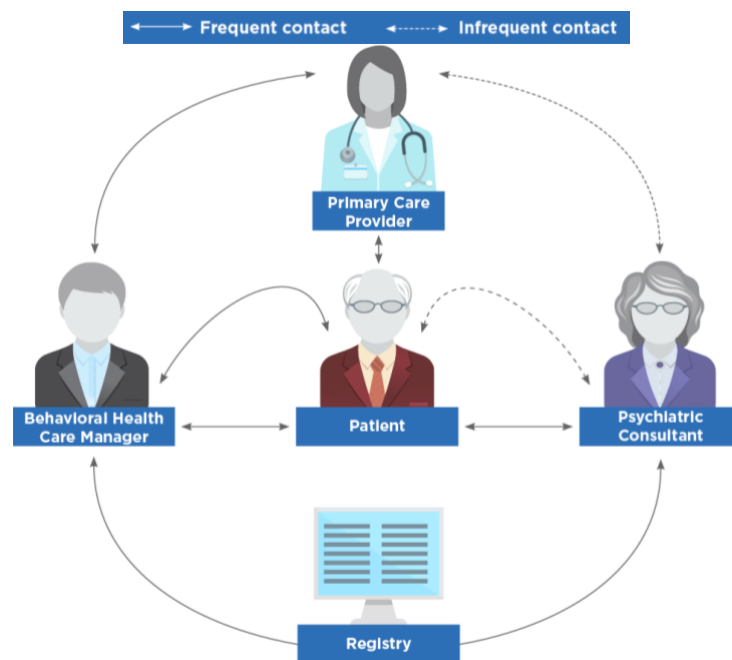


Figure 8: Patient-centered team roles in the Collaborative Care Model.⁶⁶

keep up with the high number of patients and relatively more ample supply of other health care providers. Furthermore, integrated care delivery in the Collaborative Care Model is not predicated on physically co-located team members.⁶⁶ This is a strength for the pediatric patient population because pediatric care regionalization leads to some pediatric specialists being located far away from one another and/or the patient. In practice, a patient whose provider or electronic medical record participates in the Collaborative Care Model will experience integrated services during an ED visit when their primary care provider or behavioral health manager is notified of the crisis. Notification would facilitate discharge planning and follow-up care in the outpatient setting, potentially reducing the patient's length of stay in the ED. In order for this model to be effective, the consultations and interactions within a multidisciplinary Collaborative Care team require policies to ensure appropriate reimbursement and health information technologies. Finally, the Collaborative Care Model offers cost savings in the treatment of patients with comorbid medical and behavioral health conditions. Patients with comorbidities incur costs that are 2 to 3 fold more expensive, or an estimated \$406 billion additional costs in 2017, than costs incurred by patients without behavioral comorbidities.²⁹ By integrating behavioral and medical service delivery, greater clinical and administrative efficiencies can achieve savings up to 17% of the estimated additional cost.²⁹

Besides the Collaborative Care Model, other value-based care delivery models that are relevant to the pediatric population exist, including Care Coordination, Community Home, and Transitional Care Models. Wider adoption into practice for

pediatric behavioral health emergencies and further investigations are needed to evaluate their clinical effectiveness and savings potential.

System, State, and Federal Efforts

Hospital systems across the US, states, and the federal government have all made efforts separately, as well as jointly, to care for the influx of pediatric behavioral patients in EDs. There are various ways to evaluate their collective efforts, including by examining a policy's target or lever.⁶⁸ Although the result is to improve outcomes, accessibility, or affordability for pediatric behavioral health patients, intermediary targets can include health care professionals or facilities, insurers, or even non-health care actors such as schools, juvenile detention centers, and parents. Alternatively, organizational, regulatory, and financial levers can be examined. This section will first discuss policies developed and implemented at the organizational level of hospital systems, and which have multiple targets. Next, policies that states have unique influence over will be briefly reviewed. Finally, several federal policies and related legislation will be highlighted for their overarching impact on pediatric behavioral health emergency care.

Policies and Interventions in Hospital Systems

Notwithstanding state and federal guidelines, hospitals are ethically responsible for anticipating and meeting the needs of their unique patient populations. A foundational step to achieving this involves evidence-based protocols to guide patients in behavioral health crisis through the ED.⁴³ The federal Substance Abuse and Mental Health Services Administration published a set of guidelines for crisis care and developed a toolkit that

supports program design, implementation, and continuous quality improvement in EDs.²⁴ Yet a recent study found that only 46% of EDs in the US had such a policy in place.⁶⁹ Additionally, EDs in urban areas that experience a high volume of pediatric patients more likely than EDs in rural and suburban areas, which see fewer pediatric patients, to have a behavioral health care policy. This pattern affirms patterns discussed above where patients who do not live near urban areas have few options available for high quality acute care during behavioral health emergencies. This pattern also further attests to how hospital capability for pediatric care is very limited and pediatric ED readiness is low across the country. Regardless of pediatric volume or hospital configuration, 60% of EDs that have both a nurse and physician pediatric emergency care coordinator had a behavioral health care policy whereas only 39% of EDs that have only one care coordinator had a policy in place.⁶⁹ Embedding multidisciplinary teams within EDs, not just in physically fluid models such as Collaborative Care, appears to be important in addressing the high frequency of pediatric behavioral health visits to the ED. A second step to meeting the needs of an extremely vulnerable patient population is having a quality or performance improvement plan in the ED that specifically addresses care for children and adolescents.⁷⁰ These plans typically encompass data collection and evaluation for ED visits and dispositions, including admissions, discharges and transfers. They also incorporate training and education for all ED staff, as well as measurements of outcomes such as return visits, deaths, or successful connections to outpatient behavioral health care. However, only 45% of EDs had a quality improvement plan incorporating pediatric patients.¹⁴ Despite evidence supporting the establishment of a pediatric

behavioral health care policy and a quality improvement plan that incorporates pediatric patients, many EDs fall short of recommendations.

Many hospital EDs have developed and implemented a wide range of programs that may or may not be part of an overarching pediatric behavioral health policy or quality improvement plan. These programs tend to be hospital-specific policies that target individual problems. Recognizing the problem is a crucial first step. One category of programs involves enhanced identification of pediatric behavioral health emergencies through valid and reliable universal screening mechanisms. Some patients, such as those without a prior behavioral health diagnosis or those who appear to be suffering from a medical illness, may not present with an overt behavioral health complaint. However, lack of awareness and education can obscure underlying behavioral health disorders and some medical illnesses like asthma are influenced by a patient's mental state or feelings of anxiety. After one urban ED implemented a screening tool, the Mini International Neuropsychiatric Interview, it found that 41% of pediatric patients screened positive for an undiagnosed mental illness.⁷¹ Alternative pediatric screening tools include the Behavioral Health Screen, which assesses adolescents for depression, suicide ideation, post-traumatic stress, and substance use disorders, and the Ask Suicide-Screening Questions, which identifies patients at risk for suicide.⁷² Emergency medicine staff receive training to either administer these screenings and be able to clearly explain the purpose and utility of these screening questionnaires to patients and families in an emergency setting.

After identifying patients, the effective management of pediatric behavioral health patients despite workforce shortages and limited pediatric or behavioral health specialty training becomes important. First, policies can increase the overall supply of pediatric behavioral health specialists in the ED by encouraging medical students to pursue pediatrics or psychiatry as well as retention among practicing pediatric psychiatrists and other behavioral health specialists.²⁶ The following step is the deployment of this workforce in multidisciplinary teams to delivery patient-centered medical and behavioral health care. The Collaborative Care Model exemplifies how scarce behavioral health specialists can be strategically structured in teams to maximize their capacity for evaluating patients. Alternatively, a hospital ED can implement a pediatric mental health liaison program that includes both a child psychiatrist and a pediatric mental health social worker. After one hospital implemented this liaison program, the average length of stay in the pediatric ED dropped by 27% despite an increase in the acuity of mental health complaints.⁴¹ The hospital ED also admitted and transferred fewer patients to inpatient psychiatric care. These significant successes were made possible by the pediatric psychiatrist who initiated treatment in the ED and the pediatric mental health social worker who followed up with these patients on an outpatient basis while longer term treatment was established. Another key aspect of this liaison program in the ED is the continuity of care. Whereas emergency medicine physicians work in shifts, the pediatric psychiatrist and social worker remained the same and taught coping strategies, safety plans, and adaptive emotional skills.⁴¹ Another hospital that employed a combination of a pediatric psychiatrist and psychiatric social worker in their ED also found significantly

shorter lengths of stay.⁷³ Related, embedding pediatric behavioral health services within hospitals, such as in a dedicated behavioral health stabilization unit or inpatient psychiatric unit, can help reduce lengths of stay and boarding frequency in EDs. A study comparing an ED that was affiliated with an inpatient psychiatric unit specializing in pediatric patients with a standalone ED demonstrated this value through significantly shorter lengths of stay.⁵⁴ It appears that having a dedicated pediatric resource for behavioral health emergencies improves the throughput of patients through the ED.

A third personnel option that hospital EDs have experienced success after employing is a pediatric emergency care coordinator (PECC). The Institute of Medicine along with the Health Resources and Services Administration's National Pediatric Readiness Project both recommend that hospitals should have a physician and a non-physician PECC.^{17,74} Evidence supports this recommendation, since presence of PECCs in EDs is associated with having a pediatric mental health care policy, quality improvement plan, and higher pediatric readiness score.^{14,69} Gausche-Hill et al. claims that "creating the role of PECC is the single most important process change that hospital and ED administrators can implement to improve compliance with the national guidelines."¹⁴ Another important component to effectively managing pediatric behavioral health ED patients is robust training for ED staff. Knowledge in agitation treatment, trauma-informed care, de-escalation methods, and appropriate restraint use will help improve the patient's clinical course during their ED visit.⁷⁵ Hospital EDs that provide mandatory and elective seminars, events, protected time, or skills workshops can help prepare all health care professionals to competently care for pediatric behavioral health

patients, even if patient volume is regularly low.⁷² In short, programs that support the pediatric behavioral health workforce supply along with their training and strategic team-based placement help EDs manage the behavioral health crisis among children and adolescents.

A third category of programs involves care coordination that transitions patients from the ED to outpatient settings. It is critical for patients to receive follow-up care following a behavioral health crisis, but this can be challenging due to the low availability of specialists and fragmented behavioral health care system. A recent study found that less than half of pediatric patients received coordinated care after being discharged from the ED.⁷⁶ However, hospitals that implemented next-day or similar follow-up evaluations experienced decreases in return visits to the ED.⁷⁷ Other forms of transitional coordination and follow-up can involve home visits or phone calls with a social worker or behavioral health specialist. Alternatively, scheduled appointments or communication between the emergency medicine physician and outpatient pediatric specialist through the electronic medical record, as practiced in the Collaborative Care Model, can maintain a continuity of care that prevents the patient from slipping through the cracks. EDs can also form partnerships with behavioral health services in the community to coordinate transitional care that improves the patient's likelihood of receiving treatment and reduces their risks of returning to the ED. Beyond traditional behavioral health providers, services can include mobile behavioral health crisis units that respond to pediatricians, schools, or homes and divert patients away from EDs to more appropriate stabilization and evaluation centers.²⁴ Partnerships between EDs and

community-based services can take the shape of formal referral networks or shared investments in technology for data sharing or telehealth that would improve care coordination. Hospital systems have developed and implemented policies that target their specific patient population or breakdowns in ED throughput. Further investigations are needed to determine the most effective program(s) in the long term and whether hospital-specific policies can be expanded to benefit patients in other hospital systems.

State and Federal Efforts

State governments have immense influence over health care access, affordability, and outcomes of their state residents. One avenue of influence is through state requirements for health care insurers. After Massachusetts expanded health insurance coverage for children, adolescents, and young adults as part of statewide health reform policies, there were significant decreases in ED visits for behavioral health conditions.⁷⁸ Although there were initially concerns that the increased access to services will drive unsustainable growth in health care spending, the net effect was that services were moved from emergent, hospital-based settings to cheaper, community-based settings. Additionally, state expansion of health insurance reduced out-of-pocket costs for patients as well as uncompensated, charity care that hospital EDs are mandated to provide to uninsured patients under EMTALA.⁷⁸ A second avenue of state influence is through the judicial system. For example in 2014, the Washington State Supreme Court decided that boarding psychiatric patients in the ED without treatment is unlawful.⁷⁹ This ruling revised the certification of inpatient beds throughout the state, effectually mandating

health care facilities to increase their supply of psychiatric beds, and protected the rights of patients. The court's decision led to the development of new hospital policies to prevent the boarding of patients in EDs. A third avenue of state influence is through strategic funding of pediatric behavioral health care services. This can be delivered through the state's contribution to its Medicaid program or targeted funding that is disbursed annually through state budgets. Although many state-run psychiatric facilities have closed as funding dried up over the past few decades, states can still contribute funding to health care facilities to maintain crisis stabilization and inpatient treatment beds.^{23,32} This is critical in repairing the fragmented behavioral health care system and supporting hospital systems in meeting the needs of children and adolescents.

Finally, the federal government plays a major role in resolving the pediatric behavioral health crisis. Earlier, the effect that EMTALA had in designating hospital EDs as a national safety net for patients was described. Next, the Mental Health Parity and Addiction Equity Act (MHPAEA) requires that behavioral health care benefits that are covered by most health insurance plans be treated equally to medical and surgical benefits.²⁸ Since the MHPAEA was enacted in 2008 however, disparities still exist in both network adequacy and reimbursements to behavioral health providers. More stringent enforcement through targeted policies is needed for parity to be achieved. Ideally, treatment limits and financial requirements including copays, deductibles, and coinsurance, and pre-authorization rules will not be more demanding on behavioral health patients compared to non-behavioral health patients. Another instrumental federal policy is the Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) benefit, which

is a required Medicaid benefit for all children who are categorically needy. This includes those who are in federal foster care or in families that are experiencing poverty or receiving Supplemental Security Income.⁸⁰ Specifically, children under 21 years have the right to comprehensive assessment of their mental health development and to receive inpatient psychiatric services under EPSDT, along with other preventive and medically necessary care. EPSDT has evolved since its introduction by Congress in 1967 but remains the cornerstone for policies that protect healthy child development.

The American College of Emergency Physicians recommended action items specifically for hospital EDs that were listed earlier in this thesis. Similarly, the Health Resources and Services Administration (HRSA) within the federal Department of Health and Human Services supports the National Pediatric Readiness Project (NPRP), a quality improvement initiative to ensure that EDs have the essential guidelines and resources to care for children and adolescents.⁷⁴ The NPRP convenes members from states across the country to allow for benchmarking with similar hospitals, data collection and sharing, and collaborative learning.^{14,69} HRSA also administers Emergency Medical Services for Children (EMSC), a primarily grant-making program that strives to integrate pediatric care into the emergency medical services system in both inpatient and outpatient settings.²¹ The EMSC program provides approximately \$21 million to pediatric emergency care infrastructure throughout the US and pediatric emergency care applied research in 18 geographically diverse EDs. Other federal agencies, including the Centers for Disease Control and Prevention, the Agency for Healthcare Research and Quality, and the Substance Abuse and Mental Health Services Administration have also provided

funding for pediatric behavioral health care research and policy development. A final and key federal administration is the Innovation Center within the Centers for Medicare and Medicaid Services. The Innovation Center supports the development and testing of value-based health care payment and service delivery models, including the Integrated Care for Kids (InCK) Model.⁷ In 2020, the InCK Model awarded nearly \$126 million to seven states for implementing policies to sustainably reduce avoidable hospitalizations and admissions to other health care facilities, and also improve physical and behavioral health in children under 21 years of age.⁸¹ This model builds on EPSDT principles of early identification and treatment, alongside integrated care coordination and management practices used by the Collaborative Care Model. In summary, public policies have supported pediatric and behavioral health care by setting standards for the care of children, collecting data from EDs to measure patient health outcomes, and providing funding to providers of pediatric behavioral health care.

CONCLUSION

When the supply of behavioral health services declined and pediatric specialists became regionalized and unevenly distributed across the country, hospital EDs assumed greater responsibility in the stabilization, identification, and treatment of pediatric patients suffering behavioral health crises. Hospital, state, and federal policies have made efforts to address the influx of pediatric patients into hospital EDs for behavioral health emergencies, along with the corresponding long lengths of stay and boarding in EDs. However, much of these policies are developed based on retrospective, observational, and thus correlational research that make it challenging to determine the exact causes and extent of children and adolescents' clinical need. For this reason, more rigorous analyses and experimental research, wherever possible, are needed to understand the impact of these policies on patient health outcomes in addition to process measures such as health care services utilization and spending. Furthermore, data have consistently indicated worsening trends in pediatric behavioral health visit frequency, length of stay, and boarding in EDs over several decades, especially after COVID-19 became a national emergency in 2020. EDs must be prepared to identify, manage, and coordinate care for their unique pediatric behavioral health patient population. At the same time, behavioral health services in both inpatient and outpatient settings must increase their clinical capacity. Although there is still much to understand and learn, it is clear that innovative policies (e.g. Collaborative Care Model, disorder identification, management, and coordination mechanisms, and EPSDT-grounded programs) are urgently needed to care for an extremely vulnerable population. A reassessment of medical education, training,

and practice such that behavioral health care needs are more strongly integrated into medical and surgical care is warranted. Additionally, emerging technologies such as telehealth can help relieve stress on the supply of pediatric behavioral health specialists and improve access to care. Finally, health care policy must strive to convene multisector stakeholders, such as schools, juvenile detention centers, and families, with traditional health care stakeholders to adequately address pediatric behavioral health visits to EDs. Continued and increased investments to strengthen pediatric ED readiness and behavioral health care infrastructure is crucial for meeting the needs of children and adolescents in crisis.

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CURRICULUM VITAE

