

What can we learn from hospital closure?

A case study of Doctor's Medical Center, San Pablo

By

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Part I: The Safety Net, Then and Now

The Safety Net

Defining the Safety Net

In the year 2000, the Institute of Medicine (IOM) released a report on the current state of the safety net system in the US (Lewin & Altman, 2000). The IOM defined vulnerable populations as those without insurance or with inadequate coverage, and those who face other barriers to healthcare. These barriers may be financial, such as the inability to afford insurance, or non-financial, including those related to culture, language, literacy, transportation, homelessness, immigrant status, or stigmatized health problems (e.g. HIV/AIDS). Under this definition, the vulnerable population in the US is quite vast, encompassing the uninsured and underinsured, low-income individuals, Medicaid recipients, those residing in medically underserved areas, patients with special needs, many immigrants, and more.

Where does this vast population receive medical care? Safety net healthcare professionals provide a significant level of medical care and other health services to vulnerable patients, and include those who work at public hospitals, community health centers (CHCs), federally qualified health centers (FQHCs), public health departments, and any other providers directly supplying health services to this population. These institutions and professionals may serve vulnerable populations by mandate or by mission, but no matter what the reason, they form the core of the safety net by providing a large amount of care to vulnerable patients. However, there continues to be debate regarding which specific providers constitute the health care safety net. What does it mean to provide “a substantial amount” of care to what is defined as the “vulnerable population”?

One way to answer this question is to identify the core safety net providers, which is the subset of the safety net that explicitly offers health services to all patients regardless of their ability to pay, *and* who have a high ratio of uncompensated care to total payer mix. As the term implies, these providers make up the core of the safety net healthcare system, and the IOM committee argues that the disappearance of these providers would have a drastic effect on vulnerable patients’ access to care (Lewin & Altman, 2000).

The safety net is incredibly varied across the country with regards to the demand for services, as measured by the number of uninsured individuals within a community; the unique composition of the safety net within a community; and the local market, political, and social environment (Lewin & Altman, 2000). Rather than federally-defined safety net communities, states are responsible for determining their own safety net systems and funneling federal and state support appropriately. Disproportionate Share Hospital payments through Medicaid and Medicare, discussed below, is one support mechanism for safety net systems where individual states are responsible for allocating special funding to their safety net providers. Just as safety net characteristics vary across states, DSH allocation has historically been managed disparately by state and has not been well regulated, which puts safety net providers in an unstable position, one that is vulnerable to economic and political change.

The Evolving Role of the Safety Net Hospital

Starting in 1700 with the first public hospital in the US, public hospitals and academic medical centers provided charitable health and social services to the poor. The earliest of these hospitals were primarily for supporting and sheltering the sick, rather than treating and curing illness, and they were places where aspiring physicians could practice. Public hospitals were historically located in low-income urban neighborhoods, possibly in response to the lack of health care in such areas. These hospitals offered a very broad range of services, as many still do today, including primary care, specialty care, and social services (Ko & Needleman, 2012). As medical technology progressed and the healthcare sector grew, public hospitals became prominent training centers for physicians, and many developed into large academic medical centers as medical education became more standardized (Ko & Needleman, 2012).

In the past four decades, stressors unique to safety net hospitals have increasingly threatened the access to healthcare of low income urban populations (Ko & Needleman, 2012). The steep rise of uninsured individuals from 1987 to 2008 has meant that more people rely on public hospitals to receive unreimbursed care. The uninsured population became increasingly heterogeneous during this time, with a 143% increase in Hispanic uninsured and a 24% increase in African American uninsured, compared to 17% for white uninsured. Furthermore, market pressures in the early and mid 2000s drove private hospitals to reduce their charity care for uninsured and underinsured individuals, leading vulnerable populations to become even more reliant on the public hospitals that upheld their mission to serve safety net communities. During the 2008 recession, it was predicted that for every 1% increase in the unemployment rate, 1.1 million more people were uninsured (Ko & Needleman, 2012). Of course, this especially impacted public hospitals. According to the National Association for Public Hospitals and Hospital Systems (NAPH, 2010), following the 2008 recession, the nation's major safety net hospitals¹ experienced a 23% rise in uninsured patients and a 10% increase in uncompensated care. This was an increase for the hospitals that were already serving a large proportion of free services to uninsured patients.

The NAPH reported in 2010 that, of all the costs of providing care paid by safety net hospitals, 16% was uncompensated, compared to 5.8% for other hospitals. These large safety net hospitals, which represent 2% of acute care hospitals in the US, alone provided 19% of all uncompensated care nationwide. The rising uninsured population and the 2008 recession hit the safety net hospitals particularly hard: as non-safety-net hospitals withdrew their involvement with uninsured patients, the burden was placed on safety net hospitals that upheld their mission. The uninsured population rose, and with it rose uncompensated care, now concentrated at public hospitals; with dwindling local, state, and federal budgets, many services nationwide shut down, such as in-patient psychiatric facilities, leading more people to seek care in public hospital emergency departments. Furthermore, the Emergency Medical Treatment and Labor Act (EMTALA) that was enacted in 1986 meant that patients could not be turned away from any emergency department in the US, including uninsured patients. These factors, in addition to

¹ NAPH represents public hospitals in large safety net communities in the US, totaling about 140 hospitals in 2008 (or 2% of all acute care hospitals in the US).

increased admissions among the uninsured and underinsured – due in part to limited access to primary care – put unprecedented strain on safety net hospitals in the 1990s and 2000s.

While a number of local, state, and federal policies provide necessary support to safety net hospitals, such as Medicaid’s Disproportionate Share Hospital (DSH) payments and local tax appropriations, this funding may vary from year to year and often relies on state and local government finances. These supportive policies have helped many public hospitals and academic medical centers adapt to new challenges, such as the rising uninsured population prior to ACA implementation. For example, public hospital systems like Denver Health and Harborview Medical Center (Seattle, WA) responded to Medicaid Managed Care in the 1990s by developing their own plans for their Medicaid patients and creating stronger ties with community health centers and local private physicians (Bazzoli & Garland, 2012). This allowed the public systems to bolster their patients’ access to primary and specialty care, and was a model for other safety net systems. In light of recent ACA implementation, and especially the proposed cuts to large sources of funding for public hospitals, these hospitals must find ways to respond to policy changes as they have in the past.

The ACA was implemented during a particularly difficult time for safety net hospitals. In 2010, public hospitals were struggling to care for a growing uninsured and underinsured population right in the middle of a recession, where state and local budgets were unable to provide substantial support. This threatened the survival of these hospitals, and subsequently threatened the access to care for low income populations. Although the number of uninsured and underinsured has declined since healthcare reform, safety net hospitals are far from secure. Bazzoli & Garland discuss the predictions made by hospital administrators in 2010 that the newly insured population would likely have different health needs compared to those previously enrolled in Medicaid managed care programs (Bazzoli & Garland, 2012).. These differences may include long-term complex illnesses for people who were previously uninsured, but now have insurance and thus require substantial care; or services for the previously uninsured, healthier young population, who now wish to receive preventative services that their new insurance covers. This has required hospitals to identify the patient groups who were becoming eligible for Medicaid under the ACA, how to integrate this population into the medical system, and whether the existing primary care capacity could support these newly insured. Though more insured patients will mean more reimbursed care, there has been much preparation to be done on the part of safety net hospitals.

Yet the issue of uncompensated care was never expected to disappear entirely. An estimated 23 million people were expected to remain uninsured following ACA implementation, and naturally this population would disproportionately seek care at safety net hospitals. Furthermore, proposed cuts to major federal support programs, such as Medicaid DSH, meant that safety net hospitals would lose vital support that they had previously relied on for caring for uninsured patients.

The Safety Net and the ACA

One key component of the ACA is to provide more people with affordable insurance, with the ultimate goal of reducing the existing barriers to healthcare. However, a major limitation is

the approximately 23 million people who are estimated to remain uninsured despite insurance expansion (Hall & Rosenbaum, 2012). This 23 million includes about 8% of the elderly population, a group of individuals who are particularly vulnerable to poor health outcomes. Even for those who do become insured, many nonfinancial barriers to care remain, including geography, transportation, language and culture. These newly insured may continue to face financial barriers as well, in the form of high deductibles and low actuarial values, which are methods that insurance companies utilize to maintain affordable premiums. The safety net will remain essential in post-reform United States to provide access to care for both the newly insured and those that remain uninsured.

While safety net systems will play a key role in the ACA's goal of achieving universal access, these hospitals and clinics will likely face increasing financial challenges. This is supported by Massachusetts's healthcare reform, where cuts to payments that financed safety-net hospitals, in combination with persistently low Medicaid reimbursement rates, contributed to significant financial difficulties for Massachusetts's safety net sector (Hall & Rosenbaum, 2012). Safety net hospitals rely on federal support systems, such as DSH payments, that the ACA proposes to cut in order to fund the insurance expansion. The hope is that the newly insured population will provide higher rates of reimbursement, compared to their previously uninsured status, thus offsetting the cuts to federal funding. However, the ACA does not require or encourage states to change their payment rates under Medicaid, so safety net hospitals will likely continue to face chronic under-compensation from their growing Medicaid patient population.

Kane et al. (Kane, Singer, Clark, Eeckloo, & Valentine, 2012) found that in recent history – from 2003 to 2007, just prior to the 2008 recession – safety net hospitals thrived financially because they were successfully negotiating subsidies from local and state governments. Unfortunately, the present and future market does not appear to support safety net hospitals as it did even 10 years ago. The combination of an economic downturn, gradual recovery, and ACA changes including DSH funding cuts will not allow for the same level of local and state support that safety net hospitals have historically relied on. For public safety net hospitals to survive under recent healthcare reform, Kane et al. support that hospitals currently relying on politically-negotiated funding will need to alter their business strategies. They argue that public safety net hospitals will be more successful if they are able to shift their focus to cost control, quality improvement, and services that will attract insured patients. If this is not done, these hospitals will likely struggle with increased financial and competitive pressure, and the safety net population will suffer if such hospitals must cut services to stay afloat, or close altogether. This reduces access to services for a highly vulnerable portion of this country's population and may lead to adverse health outcomes such as increased mortality rates. These changes are in direct opposition to the goals of the ACA, yet ironically the ACA has already been contributing to such changes. The predicted future of safety net hospitals, as well as past examples of hospital closures and their impacts, will be reviewed at length in this paper.

Federal Support for Safety Net Systems

Disproportionate Share Hospital Payments

Disproportionate Share Hospital (DSH) payments began with the Omnibus Budget Reconciliation Act of 1981, signed by President Ronald Reagan. This legislation was designed to help fund safety net hospitals with Essential Access designation, and authorized state Medicaid programs to provide DSH payments to hospitals that cared for a high proportion of low income, Medicaid-insured or uninsured individuals. At this time, Congress required Medicare to contribute to DSH allocations.

DSH funding has since experienced a tumultuous history, defined by intergovernmental mistrust regarding payment allocation and documentation, and an expanding federal deficit and debt (Gusmano & Thompson, 2012; McKethan, Nguyen, Sasse, & Kocot, 2009). Most recently, the ACA of 2010 announced an \$18 billion (20%) reduction of Medicaid DSH payments by 2020, and a \$22 billion (75%) cut to Medicare DSH (Gusmano & Thompson, 2012; McKethan et al., 2009; Kane et al., 2012). These changes were spurred by two major factors: continued frustration over states' persistent use of DSH to boost federal Medicaid costs – thus shifting costs away from the state – and the expansion of insurance coverage mandated by the ACA, which would ideally increase reimbursement to safety net hospitals through a lower demand for charity care and a higher proportion of patients with insurance. In theory, the ACA insurance mandates should allow safety net hospitals to become less reliant on DSH payments, and the cuts to DSH payments should result in less monitoring of states' DSH usage by federal officials (Gusmano & Thompson, 2012). This does assume that the newly insured patients will continue to receive care at the safety net hospital rather than shifting to a different hospital. Fortunately, this shift of care does not appear to be a major phenomenon, according to a study by Dranrove et al (2016). The authors found that hospitals in Medicaid expansion states in general experienced lower rates of uncompensated care, and this effect was even greater for hospitals that had especially high uncompensated care burdens prior to ACA enactment (Dranrove, Garthwaite & Ody, 2016).

While the decrease in uncompensated care is a positive outcome of the ACA for more than just hospitals, the DSH cuts proposed by the same act may threaten safety net hospital survival. Safety net hospitals that have relied heavily on DSH payments now view these ACA changes as a major threat to their long-term fiscal survival. As federal deficits and debt continue to rise, it will be even more difficult for struggling safety net hospitals to demand more federal support through Medicaid and Medicare DSH funding. While the specifics of DSH expenditures and allocation of these funds vary substantially across states, these payments have been the life support for many essential, financially distressed safety net hospitals since its birth in 1981 (Gusmano & Thompson, 2012; McKethan et al., 2009). For example, the National Association of Public Hospitals and Health Systems found in 2008 that of their 115 urban public hospitals, over half of the patient population in two-thirds of their hospitals were insured through Medicaid or uninsured (Gusmano & Thompson, 2012). These hospitals had a higher dependency on Medicaid support compared to U.S. hospitals in general. Even more striking, one in five NAPH hospitals relied on Medicaid for 50% of their revenue in 2008, and DSH alone funded on average 20% of uncompensated care at NAPH hospitals (Gusmano & Thompson, 2012). NAPH argues that

without DSH, many of their hospitals would not have survived in the past, which would have left disadvantaged populations even more vulnerable to inadequate access and quality of care.

There has been significant concern over the assumption that expanded coverage will offset DSH cuts (Gusmano & Thompson, 2012; McKethan et al., 2009). People experiencing homelessness and undocumented residents will continue to require free services, including complex and costly care, and such demand will likely be concentrated in safety net communities and will thus put such hospitals at increased fiscal stress. Furthermore, even if people do comply with the coverage mandate, there will be more patients with Medicaid, yet Medicaid has historically reimbursed at rates far lower than Medicare and private insurance – estimates put Medicaid reimbursement at less than 75% of Medicare rates. DSH was originally implemented to fill the gap of uncompensated care *and* low reimbursement rates from Medicaid; opponents of DSH cuts argue that expanded coverage cannot replace DSH payments for safety net hospitals.

Unfortunately, in 2008, DSH funds were found to be doing a poor job of targeting the hospitals and populations most in need. States receiving high DSH payments had a lower proportion of poor and uninsured people, and were above average per capita income (Gusmano & Thompson, 2012). Since its implementation, states have varied in how DSH payments are allocated to hospitals. While it is unclear in most states whether or not the funds directly target the safety net, a pattern has been recognized in some states. Louisiana, which has a high poverty rate, has had a high DSH effort from the beginning and is known to direct its DSH support to its system of 10 public safety net hospitals, which provide a large proportion of charity care (Gusmano & Thompson, 2012). On the other hand, New Jersey – a more affluent state – does a poor job of using DSH to support its vulnerable population, and instead, many non-profit hospitals receive DSH funds by thoroughly documenting the charity care they provide rather than promoting public insurance enrollment (Gusmano & Thompson, 2012).

Because of this unequal distribution of funds, the ACA's DSH cuts will not be directed equally across states: high-DSH states with a lower proportion of uninsured will face the largest cuts (Gusmano & Thompson, 2012). The ACA will also restructure how DSH allocations are monitored to ensure the neediest hospitals are receiving payments, with the hope of disrupting states' inappropriate use of funds. Yet the federal government must strike a balance between preventing improper allocation of funds, and unnecessary micromanagement, a challenge that has persisted throughout the history of DSH funding.

Regardless, it is likely that disproportionate share hospitals across the country will vary widely in their experience as ACA changes continue to materialize. Those that relied most on DSH funds may not be able to make up the losses in newly insured patients, while those that have survived without DSH may face less financial hardship. Unfortunately, documentation of the effects of DSH payments on quality of care and access for beneficiaries has been persistently lacking, so it is difficult to predict the widespread impact of DSH cuts on safety net hospitals (McKethan et al., 2009).

DGME and IME Funding

Many safety net hospitals are also teaching hospitals for the next generation of physicians. Teaching hospitals are centers of research and innovation that tend to be the largest employers in their communities: the 1,038 teaching hospitals in the U.S. employ over 2.7 million

people (CMS, 2016). These hospitals often provide specialty services like burn care, and have a higher average severity of illness of patients, which translates to higher costs of teaching hospitals compared to non-teaching hospitals.

To make up for these higher costs, there are two federal support systems in place that apply specifically to teaching hospitals: indirect medical education (IME) and direct graduate medical education (DGME) funding. IME payments compensate for the higher costs of patient care at teaching hospitals and the Medicare payment deficits, and is measured as a ratio of residents-to-beds. DGME payments help fund the costs of residency programs, including resident and faculty salaries and administrative expenses. DGME payments are based on per-resident costs and vary by specialty.

As safety net hospitals rely on DSH payments, teaching hospitals rely on IME and DGME funds – and many rely on DSH payments as well. The ACA has proposed changes to IME and DGME funding that would reduce all graduate medical education payments by 35% over 10 years. This was supported by an IOM committee proposal in 2014 for replacing IME and DGME with a single per-resident amount that would not be tied to care provided to Medicare patients, unlike existing IME and DGME payments, which are connected to Medicare rates (American Hospital Association, 2016). Given teaching hospitals' reliance on these graduate medical education support systems, the American Hospital Association announced in 2016 that they did not support such changes. They argue that these changes would threaten physician training programs and teaching hospitals, and thus exacerbate the existing physician shortage.

Safety net and teaching hospitals – including the many hospitals that qualify as both – are essential to the current and future care of vulnerable populations, both in terms of services provided and the training of physicians who may continue to care for such patients. However, without federal support systems like DSH payments or IME and DGME funding, these hospitals would not survive – and even *with* such support, so many hospitals continue to struggle to stay afloat and provide care for vast patient populations.

Hospital Closure Trends

Since their creation, public hospitals have been the “backbone of the health care safety net” (Ko & Needleman, 2012: 200) in the US for urban and rural areas alike. The role of the public hospital has not changed dramatically since Pennsylvania Hospital was founded in 1751 with the mission to serve and shelter the sick poor. However, medicine and healthcare have changed dramatically since the 18th century, and the role of the hospital is no longer to quarantine the sick and poor from the general populous. The second half of the 19th century and early 20th century saw major medical advances, from antibiotics to X-Ray technology to aseptic surgical techniques, and suddenly the hospital was a place for all sick individuals, including the wealthy. For-profit hospitals arrived on the scene to take in the wealthy sick, and in 1910 these for-profit hospitals accounted for over 50% of all hospitals (Ko & Needleman, 2012). However, the Great Depression forced many for-profit hospitals into closure, and following WWII, non-profit and public hospitals dominated thanks to the Hill-Burton program, which funded hospital development (Ko & Needleman, 2012). Public hospitals flourished in areas of rapid population growth during and after WWII, such as in Richmond, CA, at the Kaiser Shipyards.

Today, urban public hospitals account for over 20% of all emergency care, one-third of outpatient visits, 60% of burn care, and 36% of trauma care (Ko & Needleman, 2012). The majority of public hospital patients, meanwhile, are covered by Medicaid, and many more are uninsured. This poor reimbursement for expensive, complex services has meant that these hospitals require substantial support, or else fail.

The failure of public hospitals has spiked a number of times in recent US history (Figure 1). Between 1980 and 2009, public community hospitals declined by 39%, while nonprofit hospitals declined by only 13% and for-profit hospitals actually increased by 32% (Ko & Needleman, 2012). The loss of public hospitals has been due to a combination of closures, conversions and mergers. Conversions and mergers, discussed later, are two alternatives to closure: public hospitals may convert to private (either for-profit or non-profit), or they may merge with larger, more financially stable health systems. Of public hospitals that were open in 1983, less than 60% of these remained open in 2003 (Ko & Needleman, 2012; Figure 2). Closures peaked in 1989 and again in 2001, while conversions dominated in 1985 and 1994-1996 (Ko & Needleman 2012; Figure 1). Meanwhile, the proportion of uninsured patients seen at public hospitals rose steadily from 1983 to 2003 (Ko & Needleman 2012). Of urban public hospitals that closed over this time period, two-thirds were the sole public provider in the entire county and provided about one-quarter of Medicaid inpatient care for the county.

Public hospitals in 1983 were more likely to be non-urban, smaller than for-profit hospitals, with few outpatient services (Ko & Needleman, 2012). As health services have steadily shifted towards outpatient clinics, these public hospitals have struggled to adapt to changes in demand amidst ongoing operating losses. The decision to close or convert in the past two decades has been influenced by many forces including local political culture, public support, the flexibility of public management, the availability of local financial resources and state support programs, and whether a change in governance structure could bring significant improvement.

A number of new public hospitals opened between 1983 and 2003, though many did not fare well. 70% of these new public hospitals were conversions from privately owned hospitals, and the remaining 30% were completely new public facilities (Ko & Needleman, 2012). Yet of those that converted from private to public, many subsequently closed or converted back to private, contributing to the overall decline of the public hospital (Figure 2).

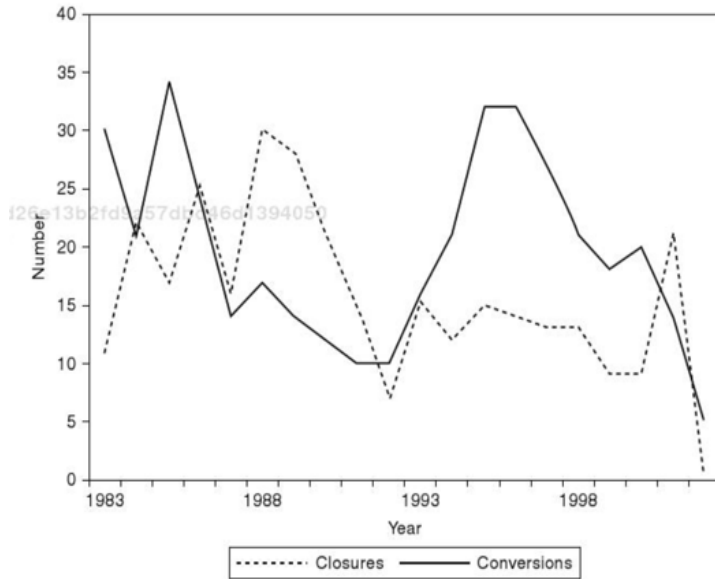


Figure 1. "Closings and Conversions of Public Hospitals, by Year, 1983-2003" Ko & Needleman (2012)

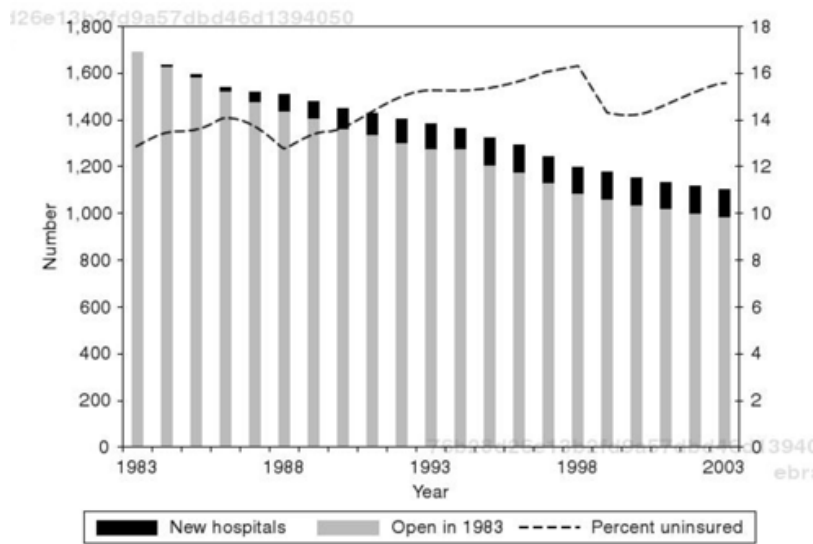


Figure 2. "Decline of Public Hospitals and Openings of New Public Hospitals, 1983-2003" Ko & Needleman (2012)

Emergency Department Closures

Emergency departments are special sources of healthcare as they serve all patients, regardless of insurance status, and they are counted on by all Americans to be there in times of unpredictable injury or illness. The loss of emergency departments, therefore, is often one of the more worrisome consequences of hospital closure, and is still a major loss to a community if the ED closes while the rest of the hospital remains open. Although federally mandated impact

assessments are required prior to an ED closure, such assessments do not address every dimension of ED closure, and the current trend the US been troublesome for many communities.

In the 10-year period of 1998 to 2008, there was a steady decline in the number of urban hospital-based emergency departments (EDs) in the US (Figure 3); meanwhile, the number of ED visits increased, especially by uninsured and publicly insured patients (R. Y. Hsia, Kellermann, & Shen, 2011a). The majority (66%) of hospital-based ED closures from 1990 to 2009 were due to the closure of the entire hospital, and safety net status was strongly associated with these closures (R. Y. Hsia et al., 2011a). This has put unprecedented strain on EDs that remain open, especially those that serve a higher proportion of uninsured and underinsured patients.

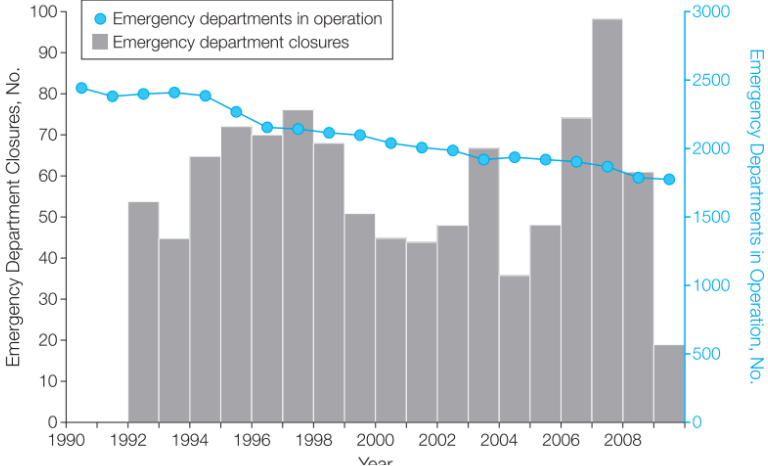


Figure 3. "Trends in Emergency Department Operations and Closures in Urban Areas, 1990-2009" R. Y. Hsia et al. (2011a).

Increased use of EDs over the past 2-3 decades has been attributed to uninsured populations and Medicaid beneficiaries, including minority and low-income groups. For example, ED visits increased by 30% from 1998 to 2008 (R. Y. Hsia et al., 2011a). Meanwhile, more publicly insured people have used the ED as a main source of healthcare as they have lost access to care elsewhere (Pitts et al, 2010). As ED overutilization rises, in part due to limited primary care access for vulnerable populations, more hospital-based EDs are meeting safety net criteria – which means that more hospitals are at risk of financial instability and closure (R. Y. Hsia et al., 2011a).

A study of ED closures in California explored the association between increased distance to the next ED and inpatient mortality rates (R. Y. Hsia et al., 2012). Although the authors hypothesized that increased distance to an ED would translate to increased inpatient mortality rates, they found that less than 10% of patients experienced an increase in distance, and this was not associated with increased mortality. One explanation for this may be that the EDs that closed had provided lower quality of care, and thus the patients were actually better off for traveling to another ED. The authors also mention that they focused on urban EDs, as these are more vulnerable to closure, and such an association may not hold for rural communities or those with special circumstances, such as very congested traffic or other difficulties with transportation. However, this study explored *inpatient* mortality rates, so nothing can be said for those patients

who did not make it to the hospital at all. The patients studied also traveled to the hospital via ambulance, but how are patients faring who choose to travel by car, public transportation, or on foot? In addition, it is noteworthy that the small proportion of patients that did experience an increase in distance to the next closest ED were disproportionately more vulnerable: they were more likely to be minorities, insured through Medicaid, and have comorbidities. In general, the effect on patients and providers of increased geographic distance to the next closest hospital or ED is under-researched, and could better inform hospital closure or conversion decision-making processes.

The Good and Bad of Hospital Closure

While some studies argue that episodic ED and hospital closures are the normal consequences of a healthy market (Joynt, Chatterjee, Orav, & Jha, 2015; Lindrooth, Lo Sasso, & Bazzoli, 2003) many others believe that this cannot hold true for all communities and hospitals (Capps, Dranove, & Lindrooth, 2010; Graddy & Ye, 2008; R. Y. Hsia, Kellermann, & Shen, 2011b; Jervis, Goldberg, & Cutting, 2012; Lillie-Blanton et al., 1992; C. Liu, Srebotnjak, & Hsia, 2014; McLafferty, 1982).

Hsia et al. (2011b) argue that the market of emergency care, and healthcare as a whole, is distorted by high numbers of uninsured and underinsured patients. In 2011, 51 million Americans remained uninsured, and another 48 million were covered by Medicaid or other public insurance that have historically reimbursed hospitals far below the costs of care. Thus, hospitals that care for underserved populations – the same hospitals that bear the burden of poor reimbursement – should not be left at the mercy of market forces (R. Y. Hsia et al., 2011a). Other authors warn against ED closures that are driven by market forces, as there is a significant ripple effect on other communities following the closure of a health service (L.-L. Liu, Jervis, Younis Mustafa Z, & A, 2011). The local community is not an island, especially in urban areas, and other nearby populations will very likely be affected by the loss of an ED or hospital. Allowing market forces to fully dictate the closure of these facilities can put many populations at risk, and not only those in the immediate service area.

In contrast, Joynt et al. contend that some hospitals, especially those providing low quality and high-priced services, *should* be at the mercy of market economics as long as the local community has appropriate alternatives, especially if they are of higher quality and lower cost (Joynt et al., 2015). Other authors contend that while some communities with higher quality alternatives may benefit from the closure of a low-quality hospital, populations in health shortage areas will have few options if the sole local provider disappears (R. Y.-J. Hsia & Shen, 2011; Jervis et al., 2012). To address this issue, Hsia et al. argue that the local community must be involved in decision making around maintaining and closing hospitals, EDs, and other safety net services (R. Y.-J. Hsia & Shen, 2011). Pure market-based approaches to healthcare will not ensure equitable distribution of services, and the unique characteristics of a hospital's patient population and local environment must be taken into account when making decisions about, or preparing for, the closure of any safety net service.

It is important to keep in mind that payments to hospitals from private insurance, Medicare and Medicaid alike, are shaped by market forces that change over time. Capps et al. note that these unpredictable market forces may cause even the most “socially optimal”

hospitals to close (Capps et al., 2010: 87). For example, a hospital that relies completely on reimbursement through Medicaid may face bankruptcy despite being highly valued by the community (Capps et al., 2010). On the other hand, a highly efficient hospital may remain in the market even if it drives up local healthcare costs, which further supports the existence of market imperfections. Graddy & Ye (2008) also support the idea that both efficient and inefficient facilities may be forced to close due to financial pressures. They argue that the termination of healthcare programs is not always tied to financial performance, which leads some efficient programs to be cut.

Still, a number of studies have found improvements in efficiency and declines in costs following a hospital closure, and it is clear that a single hospital closure may bring about both benefits and risks to populations both near and far. Lindrooth et al. (2003) found that the closure of the least efficient hospitals between 1989 and 1998 led to small but significant improvements in efficiency, with an average decline in costs of 2-4%. The savings for patients were estimated to be 6-8% in overall health costs. Lindrooth et al. do note that market imperfections may actually cause more efficient hospitals to close first, although their study found that the more inefficient hospitals were the ones to close between 1989 and 1998. Overall, the authors recommend that hospital closures should not be actively prevented in urban areas where access will remain adequate following the closure. The dominant viewpoint here is that, unless special circumstances exist, hospital and ED closures should not be prevented as long as there is local access to high-quality and low cost care. While Jervis et al. (2012) agree that underutilized and inefficient services should not persist, they warn against closing inner city hospitals that serve vulnerable populations, such as elderly and minorities, regardless of whether there is adequate access locally (Jervis et al., 2012). These vulnerable populations may be less able or confident when traveling to a new clinic or hospital for their care, and may suffer more from a disruption in their continuity of care. Jervis et al. emphasize the need to know more about which hospitals are experiencing market-driven closure, especially which populations these hospitals leave behind.

A study of five closing hospitals in competitive markets in Florida and Arizona found that the total savings from hospital bailouts are often shared nationally rather than locally, which is overall detrimental to the local community (Capps et al., 2010). Job loss due to hospital closure may have also contributed to a decline in the local economy, though this was not explicitly studied. In these five hospitals, healthcare access was not adequate in the absence of the closing hospitals, and an additional 2-14 beds needed to be built elsewhere following closure to accommodate patients. In contrast to the savings from hospital closure as proposed by Lindrooth et al., Capps et al. argue that the local community alone bears the loss of a healthcare facility, while savings do not offset losses to the community because they are distributed across the local, state, and federal government. While it may appear on the surface that the closure of some hospitals results in increased welfare, these hospitals may still be socially valuable to the local community. In an imperfect market, the forces which select for hospitals to survive or close may be indiscriminant, and it is difficult to apply a universal rule to market-driven hospital closures.

Are Hospitals Necessary?

The US healthcare system is steadily moving towards a focus on outpatient services, and away from extended hospital stays (Ryan & Mushlin, 2014). Improvements in procedures and pharmacology have minimized the need for inpatient treatment for illnesses that previously required lengthy hospital stays, such as recovery following myocardial infarction or many elective surgeries. For example, between 2000 and 2010, Medicare outpatient spending more than doubled, while inpatient spending was largely unchanged (Figure). How will hospitals adapt to these and other changes, such as payment plans, reimbursement rates, and federal support systems? Will the hospital continue to hold a central role in the future US healthcare system, or are they destined to fall to the wayside?

By the year 2000, hospitals in industrialized countries including the US began to privatize or consolidate into large healthcare systems like never before in an attempt to become more efficient (Andrulis & Duchon, 2007; McKee & Healy, 2000). Hospitals are vulnerable to economic and political shifts, as discussed previously, and mergers can provide stability as larger systems are more successful at negotiating reimbursement rates, for example ((McKee & Healy, 2000; Ryan & Mushlin, 2014). Smaller hospitals, on the other hand, must adapt to changes if they wish to survive, which was seen to a great degree in the 1990s and now, post ACA, major healthcare changes again threaten smaller hospitals. While the 1990s saw broad changes in payment plans, one prominent change in the healthcare system is the shift away from inpatient services and towards preventative and outpatient care. As these inpatient services are less utilized, hospitals may require fewer beds, while innovations in surgery may require more ORs and short-term recovery rooms. Hospitals may also adapt by expanding their outpatient clinics and, as the population ages, provide more integrated care with a nod towards degenerative conditions and memory loss. If able to make these changes, hospitals can persist, as they provide more than just healthcare services: hospitals are employers and thus an important part of the local economy; they are essential in the education of new healthcare professionals; and they are iconic components of a community. McKee & Healy argue that there is still a place in the US healthcare system for hospitals, but they will need to adapt – and it certainly helps to be part of a large, financially stable system (McKee & Healy, 2000; Ryan & Mushlin, 2014).

Figure. Medicare inpatient and outpatient institutional spending, 2000–2010.

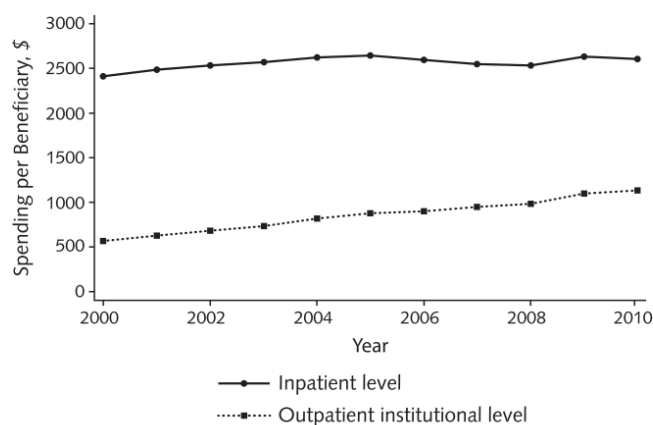


Figure 4: From 2000 to 2010, Medicare spending nearly doubled for outpatient services, and remained relatively unchanged for inpatient services. From Ryan, et al. (2014).

The public safety net hospital is unique in its vulnerability to closure and its low-income, complex patient population. The early 2000s saw a shift from the public to the private sector, in part due to a higher rate of closure among public hospitals compared to private ones, as well as some privatization of public hospitals in an attempt to avoid closure and improve efficiency (Andrulis & Duchon, 2007). However, this was not a shift away from inpatient care, as is now being observed, but was rather a natural response to the threat of closure.

Yet the hospital in the early 2000s continued to be the primary source of healthcare for many patients, especially low-income individuals (Andrulis & Duchon, 2007)– whether they sought emergency care, diagnostics or surgery, as well as outpatient care that may be provided by a hospital’s clinic. Areas with fewer specialty services, especially low-income suburban communities, rely more heavily on hospital-based specialty services. However, the low-income suburban hospitals are, according to Andrulis & Duchon, less likely to survive in the face of healthcare system changes. This is due to their smaller size, which confers less political leverage, plus there may be less publicized push-back against closure and difficulty having the voices of the local, high poverty population heard. On the other hand, urban public hospitals are less likely to close – at least, without substantial resistance – because they have more leverage, are a major source of employment, may have greater public support, and are unlikely to close without a robust impact assessment and viable alternative that would maintain adequate care for their safety net patient population.

In 2010, Kocher et al proposed two fates of the healthcare system in the post-ACA landscape: that the system would be organized *either* around hospitals, or around physician groups (Kocher, Emanuel, & Deparle, 2010). This comes in light of increasingly large physician groups, and the requirement that healthcare systems – whether they be hospitals or physician groups – invest in information technology and tracking quality measures. Kocher et al argue that, in an era of outpatient services, highly efficient physician groups could compete with hospitals for control of the healthcare system. This stands in contrast to many arguments, past and present, that hospitals have been able to adapt to economic and political changes, and that while the ACA is a major change, hospitals will likely persist as prominent figures in the U.S. healthcare system (Andrulis & Duchon, 2007; Cunningham, Garfield, & Rudowitz, 2015; Ryan & Mushlin, 2014).

It will be years before it’s entirely clear how the ACA is affecting hospitals (Ryan & Mushlin, 2014), both the good and the bad – and these findings may come too late for some hospitals. Yet just as hospitals have adapted to system-wide changes in the past, many authors are confident that hospitals will too adapt to ACA-related changes: “If history is any guide, hospitals will adapt to the ACA and maintain their prominent role in U.S. health care” (Ryan & Mushlin, 2014, 729). In fact, even before the ACA, hospital-based outpatient services were developing rapidly (Ryan & Mushlin, 2014). Hospitals have faced challenges in the past, and while many have adapted, not all hospitals survive such changes. Thus, it will be important moving forward to carefully assess the impact of such hospital closures, as unfortunately the hospitals that are typically most at risk are those that serve safety net populations who may have little to no access to care if their hospital closes. Finally, for those hospitals that do manage to adapt, hopefully they can do so without compromising patient quality of care. It will be important to keep hospitals accountable for their patient care, while also supporting them

through these sweeping changes so that they can survive to continue providing necessary health services.

What are the gaps in our understanding?

The effects that the ACA has had on hospitals and emergency departments across the country is ongoing, dynamic, and constantly being surveyed and studied, but what is known now about how hospitals are responding to and preparing for such changes? Much of the literature prior to ACA implementation focused on predicting the changes that hospitals would face, but less research explored *how* hospitals prepared for such changes, and the success of such responses and preparations. While the US healthcare system is facing new, rapid changes under the current administration, it is now of utmost importance to understand how hospitals have adapted to the changes that have taken effect under the ACA to predict how they may fare under the possible dismantling of the ACA, and how they will re-adapt to subsequent system-wide changes. Previous studies on hospital closures and adaptations, such as Managed Care or economic recessions, provide valuable insight into hospital strategies for survival, and even if the ACA is repealed, it is necessary to understand how hospitals adapted when it was in existence. Furthermore, what can be done *now*, in the midst of such changes, to ensure that safety net hospitals not only survive, but thrive?

More specific exploration of the evolving utility of hospitals as the healthcare system shifts towards outpatient care will supplement any studies of hospitals' abilities to adapt. How can federal, state and local governments best support hospitals and other healthcare facilities in this changing environment? How can smaller hospitals be supported in an era that favors consolidations and giant healthcare systems?

In terms of patients and populations, more research is warranted on the effect of geography on health, specifically how a change in geographical distance from a hospital affects both the physical and psychological well-being of communities. The few studies that explore increased geographical distance or travel time to hospitals, following a local hospital closure, focus on changes in morbidity and mortality rates. Often this is done on a large scale, mixing safety net communities with non-safety net, where the actual experience on an individual community is easily overlooked. Yet a hospital closure affects more than morbidity and mortality statistics. How does the loss of an iconic facility like a hospital affect a population's sense of community? This is particularly important for historically marginalized and otherwise vulnerable populations, the same populations that are at greatest risk of losing their local healthcare facility, and who already face barriers to care in general that too often result in avoidable adverse health outcomes. For these communities that relied on their local hospital and ED for generations, what is it like to know that the hospital is no longer there when they need it?

Finally, the current federal and state impact assessments that are conducted when a hospital or ED plans to close may not be adequately addressing the full impact of closing a healthcare facility. In what ways are these assessments successful in their predictions, and what ways are they unsuccessful? What questions are left unanswered with standardized impact assessments, and how can they be better tailored to individual communities, such as safety net versus non-safety net populations? How do the assessments explore the economic impact of

closure on the local community? The psychological impact? The impact on primary care centers and utilization?

The following sections will explore more in-depth the current state of literature surrounding hospital closure, especially factors that confer high risk of closure, conversion or merger; what is known about the impact of hospital closure on a community; options for the at-risk closure; and finally, the dynamics of public protest in response to the loss of a hospital.

Part II: Hospitals at Risk Put Populations at Risk

Factors Associated with Hospital Closure

Factors associated with hospital survival and failure in the US have implications for access to care, quality of care, and the distribution of costs within a population (L.-L. Liu et al., 2011). When it comes to supporting individual hospitals, an understanding of the factors that put a hospital at risk of closure is essential. Both financial factors, such as profit margin and reimbursement, and nonfinancial factors, such as a hospital's mission, are influential in the long-term survival of a hospital. While nonfinancial factors have been noted in much of the literature surrounding hospital closure risk, financial factors predominate as the most directly influential components of survival. A hospital in the US, like other types of organizations, cannot survive in the market without adequate financial support.

Yet the factors associated with the financial viability of hospitals, especially safety net hospitals, are not consistent across time and space (Kane et al., 2012). For example, Kim (2010) describes hospitals at risk of closure from 1998 to 2001, when hospitals experienced heightened instability due to a decline in Medicaid reimbursement rates, increased HMO penetration, higher levels of competition, and increased credit risk. Kane et al. (2012) found that as the number of uninsured patients and local hospital competition rose from 2003 to 2007, some safety net hospitals suffered from declining profit margins while others thrived financially (Kane et al., 2012). R. Y. Hsia et al. (2011b) studied the closure of hospital-associated EDs from 1990 to 2009 and found many factors that contributed to closure, including for-profit ownership, local competition, safety net location, and poor profit margin (R. Y. Hsia et al., 2011b). Finally, a study of more recent hospital closures between 2009 and 2011 found an increased rate of closure among hospitals that were urban (especially safety net), located in the South, had poor profit margins, and/or were under for-profit ownership (Joynt et al., 2015). As Schatzkin et al. wrote in 1984, hospital closures "reflect the interplay of complex demographic and economic forces" (Schatzkin, Care, May, & Schatzkin, 1984: 379).

Nonetheless, many researchers over the past three decades have attempted to elucidate the details of such financial factors that affect the risk of hospital closure. The most commonly studied factors that have a direct impact on hospital finances include those mentioned above, specifically: ownership and governance structure, occupancy rate, trends in profit margins and debt, reimbursement rate and payer mix, teaching status, and local competition (Friedman, Owen, & Perez, 2016; R. Y. Hsia et al., 2011b; Joynt et al., 2015; Kane et al., 2012; Lillie-Blanton

et al., 1992; L.-L. Liu et al., 2011). Yet the mechanism by which these factors influence survival or closure risk is inconsistent and strongly influenced by the economic and political context, such that one factor that implicated a high risk of closures in the 1980s may not have the same effect in the post-ACA era.

Regardless of the cause, hospital financial stress often affects the quality of care and delivery of care, and the range of services provided at a facility (Kim, 2010). As these hospitals linger in the market, quality may continue to decline and costs may increase as the hospital struggles to remain open. On average, financially distressed hospitals remain open for two to six years despite continued operating or net losses (Langabeer, 2008). Non-profit hospitals tend to be more likely to remain in the market despite financial stress, and thus these hospitals are more likely to face gradual declines in the quality of care offered (Kim, 2010).

Hospital Characteristics Associated with Closure

Hospital Ownership and Governance

There are three major types of hospital organizational control: government, non-profit, and for-profit. Studies have explored how the type of governance and ownership affects the rate of survival among hospitals, and most consistently, for-profit hospitals are found to be at the greatest risk of closure (R. Y. Hsia et al., 2011b; Joynt et al., 2015; Kane et al., 2012; L.-L. Liu et al., 2011), followed by safety net hospitals of any governance structure, and then teaching hospitals (Kim, 2010). For example, private for-profit hospitals were found to have the fewest number of beds, the lowest ratio of interns and residents to beds, and the fewest high-tech services, which all contribute to an increased risk of closure (Kane et al., 2012). In contrast, non-profit hospitals designated as Essential Access, which receive DSH payments, were less likely to close compared to both government owned and for-profit hospitals (L.-L. Liu et al., 2011).

Kane et al. draw conclusions about how the type of governance may influence survivability. They find that public hospitals are more financially stable when directly governed by elected officials *and* located in highly competitive markets. This contradicts the general finding that public hospitals – especially safety net hospitals – tend to struggle in highly competitive markets ((Harrison, 2007; Joynt et al., 2015; Kane et al., 2012; Lillie-Blanton et al., 1992; Ramamonjarivelo et al., 2014; Kim, 2010).

However, Kane et al. find that public hospitals that were governed by elected officials *and* were located in competitive markets received larger subsidies, possibly due to their leaders' political skills and connections, which contributed substantially to the hospitals' financial wellbeing. This form of governance had lower impact in less competitive markets, and the authors speculate that political independence allows hospitals in less competitive markets to better negotiate reimbursement rates. The public hospitals governed by elected officials offered more charity care, saw a higher proportion of Medicaid patients, had a higher ratio of interns and residents to beds, and had high operating and total profit margins (Kane et al., 2012). Overall, this strong financial leadership was beneficial to public hospitals during the study period, while the lack of a robust financial system was associated with dysfunctional overall management and increased vulnerability to closure (Kane et al., 2012).

Ownership type was the only characteristic that showed differences in closure risk between urban and rural hospitals in the mid-to-late 1980s (Lillie-Blanton et al., 1992). While there was no significant difference in the risk of closure for public and for-profit hospitals, private non-profit hospitals were more likely to survive in rural areas than urban ones between 1985-1988.

Hospitals under governmental ownership tend to be more vulnerable to fluctuations in the nation's economic wellbeing, as they depend on local, state, and federal government funding (Ramamonjarivelo et al., 2014). Public hospitals in financial distress are particularly troublesome for the government entities that own them, especially during economic downturns. Additionally, these hospitals have less freedom obtaining key financial resources, such as local or state government relief funding, compared to privately owned hospitals. Financially distressed public hospitals may turn to privatization as a strategy for survival; however, privatized public hospitals were more likely to continue to be in financial distress despite conversion between 1997 and 2009 (Ramamonjarivelo et al., 2014).

For-profit ownership has also been associated specifically with the closure of non-rural hospitals with EDs, which experienced a 27% decline (from 2,446 to 1,779 open facilities) between 1990 and 2009 (R. Y. Hsia et al., 2011b). Other factors associated with such closures over this time period are a competitive local market, location within a safety net community and/or in a county with a high proportion of minorities or population in poverty, and a poor profit margin (R. Y. Hsia et al., 2011b). For-profit hospitals that serve a high proportion of Medicaid and Medicare patients are more vulnerable to closure compared to government and non-profit hospitals serving the same patient population (L.-L. Liu et al., 2011). Liu et al. (2011) argue that this may be due in part to the high variation in DSH payment allocation across states, and that DSH is one policy that significantly affects the financial performance of hospitals under all types of organizational control.

Some of the factors that put hospitals at risk of closure may persist regardless of the type of organizational control. These include system affiliation, occupancy rate, and debt, according to one study that compared financial risk factors across government-owned, non-profit, and for-profit hospitals between 1997 and 1999 (L.-L. Liu et al., 2011). All three types of hospitals were found to be at an increased risk of closure if they were not affiliated with a large healthcare system, had a low occupancy rate, and had high levels of debt (Landry & Landry, 2009; L.-L. Liu et al., 2011). Poor management has also been highlighted as a major factor in hospital bankruptcies regardless of organizational control, yet hospitals filing for bankruptcy also tend to have fewer beds compared to competitors, were less likely to be members of a system, and had a poor payer mix (Landry & Landry, 2009). It is unclear whether poor management may put hospitals at risk, or if poor management reflects deeper financial and managerial issues.

Hospital Occupancy and Size

Hospital size, often measured by the number of beds, and its occupancy rate have been correlated with financial distress and closure risk (Kim, 2010; Lillie-Blanton et al., 1992; Lindrooth et al., 2003; McLafferty, 1982). This factor appears to persist despite contextual political and economic factors, as authors have explored this phenomenon among hospitals from at least the 1970s until present day. For example, a study in 1982 by McLafferty examined hospitals in New

York City in 1970-1981 and found that those operating below capacity were more likely to close, including those in medical shortage areas where local competition was not present (McLafferty, 1982). While the small size and persistent low occupancy rates of these hospitals could point to a low demand for services, McLafferty argues that their closures are worrisome as they may cause shifts towards larger facilities and a subsequent increase in costs for patients (McLafferty, 1982). Indeed, since the 1970s there has been a dramatic shift towards larger hospital systems, and medical spending has skyrocketed. Is it possible that the closure of these small, low-occupancy hospitals has contributed to such changes in the US healthcare system over time?

A similar association between hospital size, occupancy and closure risk was noted in the mid-1980s. Lillie-Blanton et al. found that both rural and urban hospitals with fewer than 50 beds and/or less than 20% occupancy had closure rates that were at least twice the average for other rural and urban hospitals between 1985 and 1988. When other hospital characteristics were held constant, Lillie-Blanton et al. show that hospitals in 1985-1988 with fewer than 100 beds were at 5 to 13 times great risk of closure, and those with occupancy rates below 40% were 3 to 6 times more likely to close, compared to hospitals with more beds and higher occupancy rates.

Unlike Lillie-Blanton et al., Lindrooth et al. and others have found that a low occupancy rate regardless of bed number have been associated with an increased risk of closure (Jervis et al., 2012; Lindrooth et al., 2003). Lindrooth et al. showed that hospitals that did not survive had an average occupancy rate of 48% over the study period, compared to 64% at competitors (Lindrooth et al., 2003). The cost of an empty bed appears to contribute to significant inefficiencies that lead to financial struggle and eventual closure, while hospitals with higher occupancy rates are more efficient and more likely to survive.

Hospital Profit Margin and Debt

Lower hospital profit margins and high levels of debt, which each put hospitals at risk of closure (Graddy & Ye, 2008; Jervis et al., 2012; C. Liu et al., 2014) have also been associated with higher paying salaries and a higher HMO penetration in the market (Kane et al., 2012). A high HMO presence diminishes private insurance payment rates, contributing to a lower overall reimbursement for services provided by the hospital. Hospitals with negative profit margins are more likely to close EDs and trauma centers compared to hospitals with positive or neutral profits (Kane et al., 2012), and those hospitals with high levels of debt that are also located in urban minority settings are particularly vulnerable to closure (Jervis et al., 2012). The closure of hospitals, EDs and trauma centers, especially those that serve urban minority populations, further reduces the access to health care for vulnerable populations and may widen health disparities (C. Liu et al., 2014). The impacts of these closures, including reduced access, are discussed later in this paper.

Conversely, higher operating margins were found to be associated with more high-tech services and more free care offered by the hospital (Kane et al., 2012). Kane et al. speculate that keeping up-to-date with technology may be more profitable than using low-tech services, while more charity care likely qualifies the hospital for additional subsidies (Kane et al., 2012).

Diversity of Services

Lindrooth et al. (2003) found that hospitals that closed between 1989 and 1998 were about one-quarter the size of their competitors, but with a nearly identical case-mix. Thus, prior to closure these hospitals were working on a smaller scale and did not offer unique or specialty services that may have made them more attractive to paying patients. Yet there are some services that are less profitable and put hospitals at increased risk of closure, especially trauma services and teaching programs (R. Y.-J. Hsia & Shen, 2011; Kim, 2010). Such services require public funds to survive, and as discussed previously, these funds are incredibly vulnerable to fluctuations in the economy. Conversely, services that are aimed at complex care and immediate needs, with the exception of trauma services, tend to be protective against closure (Kim, 2010; Lillie-Blanton et al., 1992). Social work services were also protective for NYC hospitals from 1975 to 1981 (Schatzkin et al., 1984).

Environmental Characteristics Associated with Closure

Some of the factors that have the greatest impact on whether a hospital survives are outside the control of the hospital itself. These include the makeup of the patients that the hospital services, often a reflection of the local community; the city, county and state's investment in healthcare; and the degree of local competition for healthcare delivery. These forces ultimately determine the financial success of a hospital, yet unlike the factors discussed in the previous section that have to do with hospital operations and management, these factors have to do with the makeup of the local environment. So, what are these broad environmental factors that put hospitals at risk?

Urban hospitals that closed in the 20 years between 1987 and 2007 were located in areas with low healthcare and hospital expenditures, especially counties with lower revenue and higher poverty rates; these hospitals also provided a disproportionate share of Medicaid care, likely a reflection of the local poverty rate and poor investment in healthcare, which contributes to financial distress through poor reimbursement (Ko, Needleman, Derose, Laugesen, & Ponce, 2013). These hospitals were also more likely to be controlled by city or county governments (Ko et al., 2013). Many factors that are associated with conversion, especially privatization, are linked to environmental factors such as increased local competition and an inability to compete for third-party payer contracts (and thus higher reimbursement rates) (Ramamonjiarivelo et al., 2014). This section will explore each of these environmental factors that put hospitals at risk of closure or conversion.

Payer Mix and Patient Costs

A hospital's payer mix is the proportion of revenue it receives through government-based insurance versus private insurance versus self-pay. Hospitals that serve a high proportion of Medicaid patients are said to have a "poor payer mix," and will receive lower reimbursement rates compared to a hospital with many privately insured patients. Urban hospitals that serve vulnerable populations are more likely to have high proportions of Medicaid and Medicare patients, which puts these hospitals at risk of closure (Jervis et al., 2012). In the early 1990s, over 98% of California mayors attributed public hospital closures primarily to insufficient

reimbursement from government insurance (Graddy & Ye, 2008). This is problematic as US healthcare reform, as it stands now, aims to further reduce federal reimbursement for services in an attempt to cut health spending.

A study by Liu et al. (2011) investigated the causes of hospital financial distress from 1996 to 2000 and found that payer mix and reimbursement had a greater impact on for-profit hospitals, and less of an impact on government and non-profit hospitals. The authors determined that for-profit hospitals serving higher proportion of Medicare and Medicaid recipients had a significant risk of financial distress and subsequent closure, while the same payer mix had minimal to no effect on government and non-profit hospitals (L.-L. Liu et al., 2011). This may be a phenomenon of variations in DSH payment allocation among states, where government and non-profit hospitals tend to receive more DSH support. Consequently, and as discussed previously, the DSH program is an example of one policy that strongly affects the financial performance and closure risk of hospitals in the US. This is supported by Kim (2010), who found that a higher proportion of Medicaid patients was correlated with an increased risk of financial distress for hospitals in general (Kim, 2010) Additionally, hospitals with a higher HMO penetration were at increased financial distress, likely due to fewer hospital admissions and shorter lengths of stay, which reduce hospital profitability (Kim, 2010).

R. Y. Hsia et al. (2011b) studied factors that put emergency departments at risk of closure from 1990 to 2009 and identified a number of environmental factors that were related to an increased risk of closure, including a poor payer mix, as well as local market competition (especially the presence of another ED within a 15-mile radius), and a location in a county with a high proportion of minorities, poverty, and uninsured or publicly insured. In general, EDs located in safety net communities were at high risk of closure as these populations lose access to primary care and increase their utilization of EDs (R. Y. Hsia et al., 2011b), especially for chronic conditions with complex comorbidities. A demand for high-cost services combined with poor reimbursement from government insurance, or none at all, sends safety net EDs into a spiral of financial losses that many public hospitals find impossible to support.

A look at hospital survival in the 1980s shows that poor reimbursement alone has not always been the strongest predictor of closure, and that high patient costs contributed significantly to closure. Hospitals that closed between 1985 and 1988 had suffered increasing financial losses, specifically on patient care, in the three years prior to closure (Lillie-Blanton et al., 1992). While the median revenue per case was about equal between hospitals that closed and those that remained open, the hospitals that closed had dramatically higher total expenses per case and cared for a lower proportion of Medicare beneficiaries, in the three-year period from 1985 to 1988 (Lillie-Blanton et al., 1992). Hospitals with more Medicare patients were more likely to remain open during the study period. This led the authors to conclude that “higher costs [of care per patient] rather than lower revenues per case were primarily responsible for the lower profitability of closed hospitals” (Lillie-Blanton et al., 1992: 336). More complex patients may require more interventions, procedures, and attention from healthcare providers and hospital staff, and if reimbursement does not match the high-cost services, the hospital will be at a loss financially.

Local Competition

Market competition is significantly correlated with financial distress for urban hospitals (Kim, 2010; Kane et al., 2012; Lillie-Blanton et al., 1992) that often leads to merger, consolidation, or closure (Harrison, 2007). The presence of two or more hospitals within a county is an indicator of competitiveness, and these hospitals were twice as likely to close compared to hospitals that did not have competition within the same county in 1985-1988 (Lillie-Blanton et al., 1992). Thus, hospitals may be less vulnerable to closure if they are the solo inpatient provider in a geographic area, especially in urban regions. Public hospitals in competition with private non-profit health systems are particularly vulnerable to closure, as the public hospital must compete for patients with private insurance (Graddy & Ye, 2008; Kane et al., 2012).

Health services areas with hospital closures between 2009 and 2011 had more specialist physicians per 100,000 residents, though fewer primary care physicians (Joynt et al., 2015). This indicates that an oversupply of medical services in an area may lead to the closure of some services, hospitals included. Specifically, facilities or providers that cannot compete with other providers in an area that is oversupplied may not make enough revenue to survive. Unless there are improvements in patient outcomes, oversupply and increased spending indicates a wasteful use of resources if there is not sufficient demand.

The implications of market-driven hospital closures, and whether they should be prevented, was discussed previously. This is a contentious issue that authors have disagreed on for decades.

Local Poverty and Unemployment

High local unemployment and poverty rates are associated with urban hospital financial distress (Kim, 2010; Ko et al., 2013), likely due to a higher proportion of underinsured or uninsured patients and subsequent low reimbursement rates. Specifically, Ko et al. (2013) found that a high poverty rate was associated with a 21.2% higher hazard of closure, which they attribute to a community-wide paucity of funds that leads to less reimbursement and support for local healthcare facilities (Ko et al., 2013).

Minorities and Residential Segregation

The proportion of minorities in a community, as well as the degree of residential segregation in an area, are often studied alongside poverty rates as these factors tend to be inextricably linked. Ko et al. (2013) address the impact of residential segregation on hospital survival, and try to tease apart socioeconomic status and segregation to explore how each of these, separately, affect public hospitals. Their study of urban public hospitals in the US that existed between 1987 and 2007 elucidates an interesting interaction between segregation and poverty: areas with high levels of segregation *and* high levels of poverty faced significantly higher rates of hospital closure, yet segregation alone was not associated with an increased risk of closure (Ko et al., 2013). In fact, a higher proportion of African American residents was associated with a lower hazard of closure, and the authors interpret this to be an effect of greater overall safety net resources and hospital utilization in communities that are predominantly African American (Ko et al., 2013). In more integrated communities, private hospitals tended to provide a greater share of safety net care (Ko et al., 2013), easing the burden

on public hospitals that traditionally provide the majority of under-reimbursed care. Ko et al. recommend that policymakers consider these specific social factors, not just proxies such as poverty rate, socioeconomic status, or proportion uninsured, when allocating safety net resources (Ko et al., 2013). They warn that “black residential segregation, in conjunction with a rise in poverty, may further spur the shift toward hospital closures” (Ko et al., 2013, 255). There are larger structural forces at play that have major impacts for the well-being of the safety net and must be taken into consideration in any policy change if we are to approach equity in healthcare delivery.

More often than not, any mention of minorities or segregation in studies that explore hospital closure is tied to socioeconomic status and poverty rates. An older study of New York City hospitals in 1970 to 1981 found that those hospitals that were located in low-income, minority neighborhoods were more likely to close (McLafferty, 1982), yet in this analysis the two key variables, socioeconomic status and proportion of minorities, were not examined separately as the study by Ko et al. (2013) demonstrated. The authors also note that many of these communities are located in medical shortage areas, which are the areas that are least equipped to keep a hospital afloat (McLafferty, 1982). Another study notes that health services in poor segregated neighborhoods were more likely to close compared to those in affluent neighborhoods (Schulz, Williams, Israel, & Lempert, 2002), but again there is no exploration of the impact of the level of segregation alone.

A past study conducted in 1984 explored the race of inpatients in hospitals in New York City from 1975-1981, and found that the proportion of inpatients that were non-White was a better predictor of hospital closure than neighborhood racial composition (Schatzkin et al., 1984). This study, alongside the more recent study by Ko et al. (2013), exposes the influence of race on hospital survival that has persisted across time and space within the US.

Age of Local Population

The study in 2010 by Kim explored, among many other factors, how the proportion of elderly individuals (≥ 65 years old) in a community affect the local hospital’s financial wellbeing. Kim found that a greater proportion of elderly was associated with increased hospital financial distress, and the author concludes that hospitals that rely heavily on Medicare reimbursement are more likely to face financial distress. The author here assumes that the proportion of elderly in the community is directly representative of the proportion of Medicare beneficiaries. What about non-elderly people with disabilities who are also covered through Medicare? Does a greater proportion of elderly in the community translate to a higher proportion of elderly *patients* seen at that local hospital? While the relationship between a high local elderly population and increased hospital financial distress is interesting, it is unclear why this phenomenon is observed.

Another study, published only two years later, found that a larger elderly patient population was in fact protective against hospital closure (Jervis et al., 2012), in contrast to Kim’s findings discussed above. These authors studied the relationship between the proportion of elderly *patients*, rather than all elderly individuals in the community, and found that hospitals that did not close during the study period had a larger elderly patient population compared to hospitals that did close. Additionally, the authors separated Medicare beneficiaries from the

total elderly population, and did find that a greater Medicare penetration was correlated with increased risk of hospital closure, as Kim also argued. Clearly, in this study at least, the elderly patient population is not identical to the Medicare population. These authors suggest that the inner-city hospitals in their study were meeting the needs of their elderly patients, and thus those that served more elderly patients were more successful and likely to survive. However, the authors do not postulate *how* a greater proportion of elderly patients may be protective against closure, especially given the fact that a greater reliance on Medicare reimbursements is, according to both studies, correlated with greater risk of closure. Especially as the U.S. population ages, it will be of interest to hospitals and healthcare systems to understand the relationship between elderly patients and hospital survivability.

Macro Factors Associated with Closure

State and Local Government and Economy

Lillie-Blanton et al. found that differences in the local economy had an impact on hospital survival (Lee & Alexander, 1999). In areas with a weak or declining economy, defined as areas with a declining population, increasing unemployment rate, and/or low per capita income, hospitals had higher odds of closure compared to hospitals in areas with strong local economies. A stark example of this phenomenon was observed in Texas in the mid-1980s, when the state suffered an economic downturn. During this time, there was a spike in both rural and urban hospital closures that did not reflect a national trend. It was hypothesized that the state's declining economy and accelerated hospital closures were related, however Lillie-Blanton et al. did not find strong enough evidence to support this state economy-hospital closure relationship. They argue that other factors unique to Texas, including Medicaid payment policies, should be explored as potential explanations for the high rate of closures in Texas at that time, though it is likely that the broader economic context did contribute to some degree to the state's rise in closures.

Kane et al. found that in 2012, local governments nationwide were less supportive of safety net hospitals due to the slow recovery from the economic downturn of 2008 (Kane et al., 2012). While more profitable safety net hospitals may be successful at negotiating subsidies from local governments, such as property tax transfers and Medicaid supplement payments, these subsidies are vulnerable to economic downturns (Kane et al., 2012). As a result, safety net hospitals are particularly susceptible to fluctuations in the national economy. Kim (2010) points out that this phenomenon is not unique to hospitals, as many other corporations and non-profit organizations are subject to large economic and political changes (Kim, 2010). While hospitals may be unique entities, they do share characteristics with other types of organizations.

Graddy et al. explored public California hospitals' vulnerability to changes in state and local revenue and health budget. In general, public hospitals are more likely to close as local revenue growth rates decline, while a larger local health budget is protective against closure (Graddy & Ye, 2008). Specifically, a 1% decline in the growth rate of total state revenues raises the probability of public hospital closure by 2.4% (Graddy & Ye, 2008). The authors found, surprisingly, that changes in federal funding did not have such a substantial influence on hospital closures, which they attribute to a smaller degree of variation in federal revenue. States on the

other hand experience larger revenue variations, which may translate to large changes in state support to local governments, and thus to public hospitals (Graddy & Ye, 2008).

At the community level, cities and counties that spend a larger proportion of the local budget on healthcare expenses are less likely to experience public hospital closure: for every 1% increase in the local healthcare budget, the probability of hospital closure declines by 6.6% (Graddy & Ye, 2008).

Post-ACA Predictions

With the enactment of the ACA in 2010, major subsidies and funding to safety net hospitals, such as DSH payments, will gradually be reduced during the expansion of Medicaid and federal insurance purchasing. Safety net hospitals across the US must continue to prepare for the significant reductions in federal subsidies, and may no longer be able to rely on politically negotiated funding (Kane et al., 2012). The DSH reductions proposed by the ACA will be a major challenge for safety net hospitals nationwide, especially those in states that have historically relied heavily on DSH funding for keeping their hospitals afloat. Although safety net hospitals have had an increase in newly insured patients thanks to the individual mandate, persistently low reimbursement will not override the other reductions in funding (Coughlin, Long, Sheen, & Tolbert, 2012). It is predicted that safety net hospitals will face increased competition with private hospitals for newly insured patients, and will be unable to compete as they are less able to invest in technology and innovation (Coughlin et al., 2012). Furthermore, underinsurance will continue to be a major hurdle for safety net hospitals as these hospitals will be the primary source of care for the substantial population that remains uninsured (Coughlin et al., 2012).

Friedman et al. (2016) recently analyzed the effect of Medicaid expansion on hospital and ED closure or growth. The authors found that, contrary to their hypothesis, Medicaid expansion states experienced increased rates of ED closures and decreased hospital growth from 2010 to 2013, compared to non-expansion states (Friedman et al., 2016). The number of hospitals increased yearly in non-expansion states, while expansion states had a reduction in open hospitals, from 2,027 in 2009 to 2,019 in 2010 (Friedman et al., 2016). After 2010, hospitals in expansion states were 2.2% less likely to be in operation, while hospitals in non-expansion states experienced a 4.2% increase in the likelihood of remaining open. Thus, by 2013, states that had expanded Medicaid had a lower rate of hospital growth, contrary to the hypothesis that Medicaid expansion would increase hospital and health system growth (Friedman et al., 2016).

Friedman et al. conclude that ACA financial benefits may not be targeted appropriately at the hospitals that are most vulnerable to closure, and in the short-term, Medicaid expansion has had a negative impact on the country's more vulnerable safety net systems (Friedman et al., 2016). This may be due to a combination of more patients seeking care now that they have insurance, and the notoriously low Medicaid reimbursement rates that do not cover the full cost of the patient visit. Specifically, states that expanded Medicaid by 2013 saw a lower rate of growth of hospitals; compared to non-expansion states, expansion states had fewer hospitals in operation. Friedman et al. propose a number of possible explanations for this, including inherent differences between expansion and non-expansion states, or unknown confounding factors. They conclude that post-ACA hospital closures will differ in some ways from pre-ACA closures, though

it is currently difficult to predict exactly how the ACA will influence closures in the coming years (Friedman et al., 2016). The complex interactions between policy, billing, and hospital finances in the post-ACA era may have significantly different effects on hospitals today compared to previously. For example, hospitals in non-expansion states received lower DSH payments, yet were still more likely to survive than hospitals in expansion states. This is contrary to previous research that has supported higher rates of survival in public hospitals that receive DSH payments and other federal subsidies (L.-L. Liu et al., 2011). Additionally, Hsia et al. (2011b) found a long-term trend of increasing ED closures between 1998 and 2008, yet the analysis by Friedman et al. shows a reversal of this trend from 2010 to 2013, following the passage of ACA.

Table 1. Summary of factors associated with hospital closure or conversion.

Hospital Closure or Conversion Risk Factors	Relevant Studies	Factors that Applied to DMC
Hospital Characteristics		
Public Ownership	Hsia, et al (2011). Joynt, et al (2015). Kane, et al (2012). Kim (2010). Ko, et al (2013). Liu, et al (2011).	x
For Profit Governance, Safety Net, or Teaching Hospital	Hsia, et al (2011). Joynt, et al (2015). Kane, et al (2012). Kim (2010). Liu, et al (2011).	x
Low Occupancy Rate	Kim (2010). Lillie-Blanton, et al (1992). Lindrooth, et al (2003). McLafferty, et al (1982).	
Low Profit Margin	Graddy, et al (2008). Jervis, et al (2012). Kane, et al (2012). Liu, et al (2014).	x
High Debt	Graddy, et al (2008). Jervis, et al (2012). Liu, et al (2014).	x
Poor Diversity of Services	Hsia, et al (2011). Kim (2010). Lillie-Blanton, et al (1992). Lindrooth, et al (2003). Schatzkin, et al (1984).	
Environmental Characteristics		
Poor Payer Mix	Graddy, et al (2008). Hsia, et al (2011). Jervis, et al (2012). Kim (2010). Lillie-Blanton, et al (1992). Liu, et al (2011). Ramamonjarivelo, et al (2014).	x
High Patient costs	Lillie-Blanton, et al (1992).	x
High Local Competition	Harrison (2007). Joynt, et al (2015). Kane, et al (2012). Kim (2010). Lillie-Blanton, et al (1992). Ramamonjarivelo, et al (2014).	
High Local Poverty Rate	Kim (2010). Ko, et al (2013).	x
High Local Unemployment Rate	Kim (2010). Ko, et al (2013).	x
High Proportion of Minorities	McLafferty (1982). Schatzkin, et al (1984). Shulz, et al (2002).	x
Age of Local Population	Jervis, et al (2012). Kim (2010).	?
Macro Factors		
Unsupportive Local Government	Graddy, et al (2008). Kane, et al (2012). Kim (2010).	x
Declining Local Economy	Graddy, et al (2008). Kim (2010). Lillie-Blanton, et al (1992).	
ACA Changes	Coughlin, et al (2012). Friedman, et al (2016). Kane, et al (2012). More	x

The Impact of Safety Net Hospital Closure

Safety net systems support the health of communities with high proportions of uninsured and low income people, which requires that these institutions provide a disproportionate share of charity and poorly reimbursed care. They often provide unprofitable but highly necessary services, such as trauma and mental health care (R. Y.-J. Hsia & Shen, 2011; Kane et al., 2012).

This results in lower profit margins for many safety net hospitals, which threatens their long-term survival. The closure of these hospitals widens health disparities by further reducing access to care for vulnerable populations (Adalja, Watson, Wollner, Rambhia, & Toner, 2011; Jervis et al., 2012; C. Liu et al., 2014; Romero, Kwan, Swearingen, Nestler, & Cohen, 2012; Walker et al., 2011). Although hospitals that are inefficient or under-utilized should close according to economists, the loss of *safety net* services is disproportionately detrimental for the patient population they serve (Jervis et al., 2012).

Safety net hospitals often provide numerous invaluable services to the local community, such as transportation, translation, legal assistance, and access to outpatient primary care providers (Fontana, 1988). They are strong advocates for vulnerable populations across sectors, outside of the traditional realm of biomedical care. As Kane et al. (2012) argue, there must continue to be adequate support of safety net systems, especially in markets where other providers are less willing or able to adopt the safety net mission. Recall that the IOM defines core safety net providers as the subset of safety net providers who dedicate a large proportion of their services to vulnerable populations, and the IOM committee argues that the disappearance of these providers would have a drastic effect on vulnerable patients' access to care (Lewin & Altman, 2000). This section will review studies that have explored how the closure of a safety net hospital affects this population through changes in access to care, patient outcomes, and cost of care.

Changes in Access to Care

For safety net populations, accessing health care may already be difficult; add a clinic or hospital closure, and many will find themselves unable to locate or travel to a healthcare facility. For example, Bindman et al. (1995) found that people perceived more barriers to accessing care if they lived in a community with more uninsured, Medicaid beneficiaries, African American residents, and poverty – the quintessential safety net. This was correlated with an increased rate of preventable hospitalization, leading the authors to conclude that those with difficulty accessing outpatient services were more likely to have poor health outcomes, leading to a higher rate of hospitalization (Bindman et al., 1995). If this is true for safety net communities *without* a recent hospital or ED closure, then it is unsurprising that a major loss of health services will contribute to further reductions in access to care that may have significant consequences for health and wellbeing.

A case study of the closure of Martin Luther King, Jr. (MLK) Hospital in Los Angeles in 2007 looks into the experiences of primary care physicians located within 20 miles of the hospital (Walker, Clarke, Ryan, & Brown, 2011). These physicians provide insight into patients' difficulties accessing care after the hospital closed. Overall, physicians noted a significant decline in the healthcare system's capacity, and directly experienced reduced access to specialists and elective surgeries for their patients, ED overcrowding, and high demand for inpatient beds.

Patients had difficulty with continuity and coordination of care, as primary care physicians were forced to search for new, more distant specialty services. They found that the primary care physicians located closest to the hospital were the most affected, as were their patients. There were significant delays in care, including a 1.88 increased odds of problems accessing necessary medical care, 1.7 increased odds of general delays in care, and 2.62 increased odds of problems seeing a specialist (Walker, Leng, et al., 2011).

With these patients seeking care further from home, healthcare facilities and systems as far as 20 miles away were impacted by the closure of MLK Hospital. Hospitals across LA County had increased ED wait times and strains on inpatient resources. Interestingly, primary care physicians who did not serve safety net populations – who tended to be located further from MLK Hospital – were largely unaffected by the changes.

Romero et al.'s case study of the closure of St. Vincent's Catholic Medical Center in NYC focused on patients' experiences accessing care following the hospital's closure in 2010. Key informants describe a general decline in health care access, interrupted care, and a loss of emergency and specialty care, and a lack of planning, as is observed in many hospital closure studies (Romero, Kwan, Swearingen, et al., 2012). Patients themselves describe widespread anxiety, panic, fear, uncertainty, and difficulty locating, accessing, and paying for health services. While all patients were affected in some way, the loss was perceived to be magnified for vulnerable groups such as elders, those with disability or chronic illness, and patients with low income (Romero, Kwan, Swearingen, et al., 2012). Prior to its closure, St. Vincent's had been viewed as a welcoming community hospital with many local clinics that allowed for easy patient transfer and follow-up care. Many of St. Vincent's patients received multiple services from the hospital, and the sudden closure meant that patients lost their entire network of care. The ripple effect was significant, and likely contributed to additional reductions in access for other communities. At least four nearby hospitals experienced a substantial increase in patient volume, a true medical surge event, that lasted for at least one year after St. Vincent's closure (Adalja et al., 2011). With ED overcrowding and a shift in patient demographics at these other hospitals, there was more ED waiting room violence, increased emergent surgeries, and many Intensive Care Units were over capacity (Adalja et al., 2011). The loss of a major hospital like St. Vincent's can cause difficulties accessing care for a much larger geographic region.

A study by Mobley et al. examines the impacts of safety net hospital closures and conversions on different populations across California between 1990 and 2000 (Mobley et al., 2011), and highlights which groups are most vulnerable to new barriers to care. Geographic distance from the closed hospital is a key factor: those who resided near a closure or conversion, especially Medicare patients, experienced dramatic reductions in access to services. Unsurprisingly, Medicaid patients and those without insurance were much more affected compared to those with private insurance. Within a safety net population, the uninsured and Medicaid populations account for the majority of patients; if these are the folks who face the greatest barriers to care, then most of the community is going to be affected. Mobley et al. also look at the impact across race and ethnicity and find that African American patients had the greatest decline in access to care. As previously mentioned, delayed care can translate to worse health outcomes and increased costs, which will be discussed further in the following sections. Finally, the uninsured population consistently experienced reduced access over the study period

regardless of whether they lived near a closure or conversion. Thus, it appears that from 1990 to 2000, all uninsured individuals faced substantial barriers to accessing healthcare services, while Medicare, Medicaid, and African American patients living near a safety net hospital closure faced dramatic declines in access.

The closure of specialty clinics can mimic the closure of a full hospital, as seen in the closure of an HIV case management facility that served a safety net population (Khosla, Kennedy, Winch, Latkin, & Marsteller, 2015). Its closure caused a sudden absence of a unique service that served a specific group of patients, and left the entire system without a central coordination agency for HIV services. While the loss was felt acutely in the months immediately following closure, other clinics and agencies eventually added case management services in an attempt to fill the gap. Unfortunately, the emotional loss felt by this vulnerable and stigmatized group of patients could never be undone.

Other studies of the impact of hospital closures note similar declines in access to care following a closure, with a substantial ripple effect on nearby hospitals and clinics. A study that compared two communities in California, one that experienced a closure and one that did not, found a significant increase in the number of people who self-reported that they did not have a regular provider and were denied care following a local hospital closure (Bindman, Keane, & Lurie, 1990). Being denied care is just one way that access may be reduced; a number of studies point to significant barriers such as difficulties with transportation and a lack of knowledge of where to go to seek care, especially for elders (Buchmueller, Jacobson, & Wold, 2006; Countouris et al., 2014; Fontana, 1988; Walker, Leng, et al., 2011). The authors of one study found that some people were simply frustrated by changing physicians (Countouris et al., 2014), which may contribute to a decline in the number of people with a regular physician following a closure. Elders in particular felt angry, resentful, fearful, and abandoned by the hospital system as they faced challenges with transportation and locating health services, which persisted at 2 years following hospital closure (Countouris et al., 2014).

The geographic distance to the nearest hospital has been steadily increasing over time, contributing to this pervasive issue of finding transportation to access some services. In 2007, nearly one-quarter of Americans had to travel farther to get to the nearest trauma center than they did in 2001, especially for those in communities with a higher proportion of minority, poor, and uninsured individuals (R. Y.-J. Hsia & Shen, 2011). Even a seemingly insignificant increase in distance can have profound effects on those whose mobility is restricted due to illness, poverty, or other difficulty accessing transportation: in low income neighborhoods in NYC that experienced hospital closure between 1970 and 1981, there was on average another hospital only 0.6 miles away, yet the safety net population still had difficulty getting to the nearest facility (McLafferty, 1982). As US hospitals close at an increasing rate, geographic distances will continue to expand and will disproportionately affect the more vulnerable populations.

One positive change following hospital closure was noted: for the subset of the population that is non-elderly and insured, especially those with private insurance, an increase in distance to the nearest hospital may actually shift care towards local primary care clinics (Buchmueller et al., 2006), which reduces unnecessary ED visits and thus costs among this population.

Changes in Health Outcomes

Changes in access to care often lead directly to changes in health outcomes and hospitalizations (Bindman et al., 1995), though this connection is not always made explicit in studies that explore the impact of hospital closures. A number of studies have found that both urban and rural hospital closures lead to adverse outcomes as measured by changes in mortality rates, admissions, and self-reported health status (Bindman et al., 1990; Buchmueller et al., 2006; C. Liu et al., 2014; Walker, Clarke, et al., 2011). A comparison of two communities in California, one which experienced hospital closure and the other which did not, revealed declines in health status as perceived by patients, including increased pain, following hospital closure (Bindman et al., 1990). Another more recent study examined the changes in admissions and inpatient mortality following ED closures in California between 1999 and 2010, and found that one quarter of all hospital admissions during the study period occurred near a closure (C. Liu et al., 2014). For these specific hospital admissions, there was a 5% higher odds of inpatient mortality compared to admissions that were not near a recent ED closure, and mortality was highest for non-elderly adults and all patients with acute myocardial infarction, stroke, or sepsis (C. Liu et al., 2014).

A separate study found that the distance to the next closest hospital has an impact on mortality rates, especially deaths from acute myocardial infarctions and unintentional injuries (Buchmueller et al., 2006). Yet another found that Medicaid patients of all races and ethnicities had the highest admission rates following the closure or conversion of a safety net hospital or other safety net health service in California, 1990-2000 (Mobley et al., 2011). The increased admission rates suggest that certain patient populations, especially patients with Medicaid, have impeded access to primary care or preventative care services and are not receiving care until they are sick enough to be hospitalized. These findings together point to an overwhelmed system, with regard to both inpatient and outpatient services, that is incapable of supporting a greater patient load.

The case study of MLK hospital, also discussed above, found that an increase in patient delays in care and worse outcomes following the closure was associated with limited knowledge of the health system changes (Walker, Clarke, et al., 2011). Patients who did not know where to go for their care were naturally delayed in receiving care, and as a result ended up in the emergency department with unmanaged or exacerbated chronic illness, or even simply for a prescription (Walker, Clarke, et al., 2011). ED overcrowding contributed to additional adverse health outcomes, such as for a patient with cholelithiasis who had to wait so long to be seen that the disease progressed and the patient required emergent surgery (Walker, Clarke, et al., 2011). The authors spoke with primary care physicians who were local to the closure of MLK, and the physicians noted that their patients were generally sicker following the closure. They specifically attributed the decline in health status to delayed care because of poor awareness of changes, as well as a lack of transportation and the inability to physically access health services (Walker, Clarke, et al., 2011).

Joynt et al. recently argued that they found no evidence of an association between hospital closure and adverse health outcomes in their national study of hospital closures in the 2000s. They found that hospital closure had no significant impact on hospital rates or mortality rates, and had a small positive impact on readmission rates, within health service areas (HSAs)

that experienced hospital closure. They measured annual mortality rate at one year prior to closure and one year after closure, and inpatient admission rates and changes in costs per patient at two years prior to closure and two years after closure. Their findings are somewhat supported by a study by Hsia et al. (2012) that found no increase in *inpatient* mortality following a nearby ED closure among California hospitals between 1999 and 2009 (R. Y. Hsia et al., 2012). In direct contrast to the finding by Buchmuller et al., Joynt et al. found that patients in HSAs that experienced hospital closure had *improvements* in mortality for myocardial infarction, compared to patients in other HSAs (Joynt et al., 2015). The authors conclude that hospital closures do not appear to have a profound impact on access and patient outcomes, and they reason that this is due to the fact that hospitals that closed must have either been of poor quality, or that there was an oversupply of health services, which led to hospital closure without reduced access to care.

Why has the national study by Joynt et al. strongly contradicted findings from previous studies, which point to significant adverse impacts on access and health outcomes following hospital closure? Joynt et al. do acknowledge there may be negative impacts of hospital closure that they did not examine in their study, such as changes in the community's economy. It is also possible that communities that experienced closure of the sole hospital in the area, especially safety net communities, were more negatively impacted, but that this effect is minimized or lost when aggregated with all HSAs nationwide. Given the decades-worth amount of data supporting negative impacts on access and outcomes for communities that experience hospital closure, *especially* safety net areas, it is possible that the study by Joynt et al. is minimizing a major issue that cannot be fully examined at the nationwide level. Hospitals at risk of closure deserve individual attention to determine whether the local population is particularly vulnerable to difficulties accessing services and adverse health outcomes.

Changes in the Cost of Care

While substantial cost savings have been reported following hospital and ED closures (Capps et al., 2010; Cleverley, 1982), such findings should not be taken alone without consideration of changes in healthcare access, health outcomes, or unmeasured externalities. Although the local economy as a whole may benefit from the closure of a financially struggling hospital, the costs to individual patients may increase, decrease, or remain constant (Capps et al., 2010; Cleverley, 1982; Joynt et al., 2015; McLafferty, 1982). A study of five hospital closures, in which all hospitals were urban, had a low occupancy rate and small size, and were in a competitive area, found that each closure reduced overall patient welfare, *but* the authors argue that the cost savings more than offset any welfare reductions (Capps et al., 2010). Joynt et al., on the other hand, found no changes in inpatient costs following a hospital closure in their national study (Joynt et al., 2015). McLafferty's study of NYC hospital closures in the 1970s-1980s revealed that the hospitals that closed tended to be smaller and had lower patient costs, leading the author to conclude that the closure of such hospitals may increase costs to patients as they have to seek care at larger, more costly hospitals (McLafferty, 1982).

Other Changes

A hospital closure may have other impacts on the local community depending on the services offered. For example, MLK Hospital was a safety net teaching hospital, and its closure meant that fewer physicians were trained in an underserved community. This led to a loss of providers within the community both at the time of closure, and in the years following the closure, as those physicians in training no longer had exposure to this community due to the loss of the hospital and its teaching program. The shift of physician in training away from the safety net may contribute to additional inefficiencies if the physician supply is misallocated and concentrated in non-safety net areas.

Job loss for hospital employees is a significant effect of hospital closure and has been the primary focus of few studies (Havlovic & Bouthillette, 1998), but is often recognized as an important factor of planning for closure (Fontana, 1988; Khosla et al., 2015). A study of a hospital closure in Canada found that employees had significant job insecurity and stress, and despite receiving support in finding work post-closure, job satisfaction remained low (Havlovic & Bouthillette, 1998). Hospital closure can be devastating to some communities' economic system through such job loss if there is not adequate preparation and support prior to and following closure (Fontana, 1988; Khosla et al., 2015).

Options for the At-Risk Hospital

Strategies for the Financially Struggling Hospital

Lessons from hospitals that have successfully navigated financial distress – and those that did not fare so well – are vital for hospitals that may be at risk of closure or conversion, especially given the prevalence of financial distress among US hospitals today (Langabeer, 2008). As safety net hospitals in particular must operate under very narrow financial margins, major strategies for such hospitals include improving quality of care while also improving efficiency and reducing costs (Coughlin et al., 2012; Kim, 2010; Langabeer, 2008). Yet there are many challenges that may prevent the long-term survival of a hospital at risk, including poor management, broader environmental issues, and political and economic changes (Landry & Landry, 2009), which are the same challenges that other sectors of the economy must manage. Other factors may influence a hospital's ultimate decision to close, including the local political culture, public support for the hospital's mission, and local financial resources and state programs (Ko & Needleman, 2012).

Successful turnarounds tend to focus on improving quality over efficiency, as the most stable route to long-term recovery is through increased patient revenues as opposed to continued reliance on support from other sources, such as the local or federal government (Coughlin et al., 2012; Langabeer, 2008). Langabeer (2008) points out that hospitals that focus on improving efficiency tend to be less successful as hospital culture, mission, and patient care falls by the wayside (Coughlin et al., 2012). While efficiency shouldn't be the sole focus, improving efficiency and reducing costs is certainly a component of a hospital's ultimate success, especially public safety net hospitals that will continue to operate under a tight budget (Coughlin et al., 2012; Kim, 2010). Keeping beds filled and using resources efficiently is important for short-

term survival, especially given the strong relationship between occupancy rate and survival (Kim, 2010). A successful turnaround also involves changes in leadership, not just the CFO or CEO but other positions as well, including downsizing the board of directors (Langabeer, 2008), as poor management is a major detriment to a hospital, and new perspectives and skills may pull the hospital out of trouble.

Partnerships with local providers, rather than attempting to broaden the hospital's geographic coverage areas, can bolster a hospital's survival (Kim, 2010; Ko et al., 2013). Public hospitals in residentially segregated regions may consider investing in such partnerships, which may improve quality of care for the Medicaid patients that make up the bulk of the safety net hospital's patient load (Ko et al., 2013). Any hospital located in a particularly competitive environment can benefit from partnerships with local physicians (Kim, 2010), which can improve continuity of care and access to services outside of the hospital.

A hospital's mission can play a surprisingly key role in long-term survival, and adjustments to the mission may be necessary. Hospitals with a clear dedication to and understanding of the local community's needs can help a hospital thrive (Khosla et al., 2015). Making changes to the mission is not going to save the most distressed hospital, as the overall business model may need tweaking, but it may lead to stronger community support and a diversification of services to better fit the population's needs (Khosla et al., 2015).

A study by Coughlin et al. examined the themes of five successful safety net hospitals and identified organizational attributes were critical to lasting performance (Coughlin et al., 2012). A strong, stable leadership and a mission that was aligned to both safety net and academic commitments were essential to the success of these hospitals. They also identified two factors that highlight the importance of keeping with today's changes: health information technology (IT) and system integration. Health IT was utilized in all five hospitals to improve care and delivery for patients in the long term, and system integration involved extended primary care capacity and specialty services. Essentially, these hospitals invested in modern technology to improve both quality and efficiency, and they expanded outpatient services within the hospital system, which reduced costs for all. Successful hospitals were able to adjust to broader shifts in society and in the healthcare system.

Hospitals that are not successful in emerging from a financial crisis tend to focus too heavily on system-wide efficiencies and sweeping reductions, which more often than not leads to poor quality of care (Langabeer, 2008). These hospitals point to environmental challenges that primarily drove their failure, mainly declining reimbursement rates and increased costs of supplies, pharmaceuticals, and technology (Langabeer, 2008). As mentioned above, the hospitals that were able to make changes such as improvements in health technology and expanded outpatient services were more likely to succeed, while those that are so financially impaired that such changes cannot be made are more likely to fail. Such severely distressed hospitals last, on average, for 2 to 6 years with continued losses before closing or merging (Langabeer, 2008). Hospitals that may be at risk in the future must recognize this as early as possible and make changes to avoid future distress.

In an era of rapid changes within the US healthcare system, communication and early action are essential if a hospital hopes to keep up with such changes. Poor communication among leaders and employees of a hospital leads to failure to make necessary changes, overall

discontent, and a high staff turnover, all of which contribute to a hospital's ultimate downfall (Khosla et al., 2015).

In today's economic, social and political environment, safety net hospitals must focus on quality improvement and cost control that attract insured patients – those that do not make necessary changes to do so will face serious financial difficulties with ACA implementation and subsequent DSH payment reductions. Hospitals must move away from relying entirely on government funding and support, and focus on patient revenues and quality of care. Unfortunately, low government insurance reimbursement rates and high competition for privately insured patients will make this difficult for most safety net hospitals, especially those that are not members of a large and successful system. Those hospitals that are unable to turn around will face bankruptcy, conversion or merger, or closure, each of which is discussed below.

Bankruptcy

Hospitals may file for bankruptcy under two circumstances: involuntarily as demanded by creditors, or voluntarily as a strategic method of reorganization or financial relief. Landry & Landry found that, while some hospitals may re-emerge from bankruptcy, the majority of bankrupt hospitals ultimately close and the local economy suffers and the community faces reduced access to care (Landry & Landry, 2009). Between 2000 and 2006, 42 US hospitals filed for bankruptcy, and 66% of these had closed by 2008; the remaining hospitals had remained open, but some were still operating under federal bankruptcy reorganization. Larger hospital systems were better equipped to deal with financial distress in general, compared to smaller hospitals (with fewer beds) and those that are not members of a system. Financial mismanagement was a predominant theme across hospitals that filed for bankruptcy between 2000 and 2006, as is observed in other types of organizations that file for bankruptcy (Landry & Landry, 2009). Other themes are similar to those that put hospitals at increased risk of closure in general, including poor payer mix or reimbursement changes, competition, and poor management (Landry & Landry, 2009). Finally, fraud allegations – as related to financial mismanagement – and filing as a financial strategy were other themes across hospitals that filed for bankruptcy during the study period.

The Decision to Convert or Merge

Hospitals that are unable to emerge from financial distress or bankruptcy may seek to merge with a larger hospital system – and thus forfeit control of hospital operations – or they may convert to private ownership. The weakest hospitals, such as those that file for bankruptcy, are less likely to succeed in finding merger partners and have less negotiating power (Harrison, 2007). Stronger hospitals are more likely to engage in conversions, typically privatization. Conversions are an option for hospitals with poor management and long-term financial troubles that still wish to provide high quality health services for their local population – assuming there is a demand for such services (Hall & Rosenbaum, 2012).

Based on a study of public US hospitals from 1997 to 2009, privatization was a strategy adopted by many struggling hospitals and may be a better alternative to closure for providing financial relief to the governmental entities that own them, and for maintaining access to resources for the local population (Ramamonjiravelo et al., 2014). Privatization can provide a

hospital with access to resources, such as technology, which will improve its quality of care. It releases the hospital from government economy and politics, which was discussed earlier as a risk that many public hospitals face. Finally, keeping a hospital open, even if under different management, will prevent job losses in the community.

Hospitals tend to seek conversion when they are unable to keep up with increased competition, especially for third party payer contracts; when government insurance reimbursement declines or, as relevant to today's context, when support programs like DSH face cuts; and when inefficiencies cannot be overcome (Ramamonjiarivelo et al., 2014). Hospitals that converted between 1997 and 2009 were characterized by many factors that put hospitals at risk of closure: they were smaller with lower occupancy rates, were located in low-income counties, had low Medicare HMO penetration; and were in an environment with drastic changes in the unemployment rate from year to year (Ramamonjiarivelo et al., 2014). Interestingly, many were in less competitive markets, which is usually protective against closure. All hospitals hoped that privatization would allow the population to continue to access care at a higher quality and reduced price.

The effect of public hospital privatization on the local community has not been extensively researched, though a study by Ko et al did examine communities' engagement in hospital decision-making processes, including privatization decisions (Ko, Derosé, Needleman, & Ponce, 2014). As public hospitals tend to have a greater involvement in local public policy, privatization could introduce changes in the hospital's relationship with the community. The authors suggest that greater community engagement in hospital decision-making around closure or privatization allows the community to have more influence in local healthcare policy and ultimately, greater collective welfare. In instances without community engagement in privatization decisions, the privatized hospital may introduce changes that are not in the community's best interest; according to this study, however, these tensions are somewhat alleviated by greater local engagement.

Preparing for Closure

A hospital that is unable to emerge from financial distress or bankruptcy, and that is also unable or unwilling to convert or merge, will ultimately face closure. Hospital closure requires intense planning and preparation by the entire community to ensure continued access to services for the population, which requires communication with other healthcare systems in the region (Capps et al., 2010; Khosla et al., 2015). It is an intense process that involves the county and state, entities that must ensure the healthcare system will not be overwhelmed by the loss of a major source of care (McLafferty, 1982).

When a hospital does decide to close, there are still a number of decisions to make: will the hospital close all services completely, or will it close as a full-service hospital but remain open for some services? Hospitals that close and convert the facility to maintain some services should do so only to meet some need of the community, and as long as the reduction in costs will be at least as large as the reduction in revenue (Cleverley, 1982). This type of partial closure is less economically efficient compared to complete closure, which yields the maximum cost savings, but may also significantly reduce access (Cleverley, 1982). Hospitals that voluntarily close may earn revenue through selling the facility, but voluntary closure is often difficult as there are

financial requirements associated with closing a hospital. These costs include unemployment insurance, worker's compensation, funds for planning and implementing closure (including proper waste disposal), coverage of current liabilities, payment of debt, pensions, contractual obligations, and life or health insurance for staff (Cleverley, 1982).

Case studies of hospital closures provide unique insight into the process of hospital closure, considerations that must be made in preparation for closure, and recommendations for improvement. Dunne et al. conclude their study by mentioning the three steps of change – realizing the need for change, making the transition, and adjusting to the change – and highlight that the transition component is most often overlooked (Dunne & Davis, 1996). The transition from an existing, functioning hospital to a non-operating facility involves psychological recognition of the change, and without accurate dissemination of information throughout the entire process, many individuals – employees, providers, and patients alike – will be unable to adequately prepare for the changes to come.

A study of the sudden closure of St. Vincent Hospital in New York City, a level 1 trauma center that shut its doors in 2010, provides insight into a system's response to a looming healthcare crisis (Adalja et al., 2011). Though the closure was abrupt, hospitals within the region, especially those closest to St. Vincent, were able to make some preparations such as increasing staff and physical space, and making some innovations. Many hospital administrators and clinicians reported using techniques that would be used in the case of a pandemic, a situation where hospitals expect a surge of patients. The expected surge did occur, and primarily affected at least four hospitals near St. Vincent. The increased volume was sustained for at least a year following St. Vincent's closure, which caused ED overcrowding, more waiting room violence, a rise in uninsured patients seeking care, increased emergency surgical and psychiatric demand, and ICUs running over-capacity (Adalja et al., 2011). Although changes in quality of care and access were not explicitly explored, it is likely that, with increased wait times, quality suffered, and without any replacement of the closed hospital, access likely suffered as well.

Odom-Walker et al. interviewed primary care physicians that practiced near MLK Hospital in Los Angeles to investigate how the hospital closure process could have better involved these physicians in decision-making and improve continuity of care (Walker, Clarke, et al., 2011). Primary care physicians generally felt they were left out of the planning process, and a lack of information provided to them regarding the closure resulted in difficulty coordinating care for their patients. The hospital closure caused a decline in the healthcare system's capacity and, as a result, physicians closest to the hospital were most affected, while non-safety net physicians further away from MLK Hospital were less impacted. Patients were suddenly less able to access the services that they had once sought at the hospital, and their primary care providers were not prepared with information on where to seek such services, which led to fragmented care. The authors of this study recommend consultation with local primary care physicians in the event of a hospital closure to best maintain continuity of care and access to necessary services for the local population (Walker, Clarke, et al., 2011).

Another case study was performed *during* a hospital closure in Canada, where authors studied the use of a Physician Engagement model in order to educate and support healthcare providers through the hospital closure process (Puri, Bhaloo, Kirshin, & Mithani, 2006). The hospital provided many open means of communication with administrators and supported

physician participation in the closure process and decision-making. In the end, physicians reported feeling less anxious and that their concerns were addressed. The authors support the involvement of physicians in hospital decisions, especially surrounding closure, as their involvement can ease provider stress in the present and improve patient care coordination in the future (Puri et al., 2006).

Public Response to Hospital Closure

The Importance of Place

Humanistic geography refers to a recognition of the importance of place and the meanings that people attach to a place, such as a community (Brown, 2003). The specific elements of the built environment, such as schools, hospitals, libraries and businesses, provide a sense of place, contribute to the local identity, and have substantial symbolic value for members of the community (Brown, 2003; Kearns, 1993). A threat to the built environment, such as a hospital at risk of closure, is naturally met with public resistance and, regardless of the reasons of why the hospital is at risk – whether it is the fault of mismanagement, inefficiencies, or lack of appropriate financial support – the community may resist closure solely because of the symbolic and emotional value in its presence (Brown, 2003). For this reason, even a hospital closure that is predicted to result in improvements in quality and cost of health care may be met with public opposition. For example, the closure of St. Vincent’s Catholic Medical Center in NYC (discussed previously) was met with substantial opposition despite the fact that alternative sources of healthcare were readily available (Romero, Kwan, Swearingen, et al., 2012).

Brown (2003) developed an analytical framework, working through the lens of humanistic geography, for exploring the phenomenon of public protest to hospital closure. Using the case of Kidderminster General Hospital in the UK, which closed despite years of protest at multiple levels, Brown highlights the complex interplay across social, cultural and political contexts through which public protest develops. The resistance to the closure of Kidderminster General Hospital illustrates the importance of place and the role of the political context. The hospital was revered as a symbolic institution of health, a source of employment, a reflection of the region’s social aspirations, and a source of community support (Brown, 2003). Furthermore, its closure came during a turbulent time of National Health Service reform. The degree to which a health facility closure is met with resistance depends, in part, on how much significance is attached to the site, which varies based on the social context, such as the strength of the community’s sense of place, as well as the political context (Brown, 2003; Kearns, 1993). Any study of the closure of any public service, especially a hospital, can only address the full story by interweaving micro- with macro-level perspectives.

Community Involvement in Decision-Making

Just as case studies have supported healthcare provider engagement in hospital closure decision-making, community member involvement in such decisions helps to promote engagement and support, and prevents future barriers to access after closure, which may improve health outcomes (Countouris et al., 2014; R. Y. Hsia et al., 2011b). Many authors who

study hospital and ED failures encourage close communication with residents and patients, especially in safety net settings, prior to the final closure of the facility (Countouris et al., 2014; R. Y. Hsia et al., 2011b; Khosla et al., 2015). The earlier the involvement of outside groups, the more likely the hospital will address the real needs of patients and prevent public protest, negative emotions, and widened health care disparities when the closure finally occurs (R. Y. Hsia et al., 2011b). The social context of a community is particularly important when it comes to decision-making for urban public hospitals that face closure or conversion, and authors strongly recommend the involvement of inner-city populations (Ko et al., 2014). Engagement of disadvantaged groups is particularly important, as it may highlight specific needs of the community by giving voice to those who may otherwise be left out of the loop (Ko et al., 2014). Because communities are often emotionally tied to their local hospital, and the hospital likely provides other services outside the traditional realm of health care (such as education and information services), it is particularly essential to include the community in planning so that the needs of the people can be addressed (Fontana, 1988; Ko et al., 2014).

Without community involvement, significant public opposition can lead to a sense of loss and disempowerment within a community, especially within vulnerable populations (R. Y. Hsia et al., 2011b; McLafferty, 1982). Unfortunately, community involvement is less common in hospital closure decisions compared to public hospital privatization decisions, and often the more advantaged groups, such as administrators and politicians, have a much greater effect on outcomes (Ko et al., 2014).

Community decision-making has been practiced both within and outside of the healthcare service realm. A UK National Health Service reorganization document in 1982 encouraged decision makers at all levels to include community members and local providers in health-related decisions so that patients' needs are met (Brown, 2003). In 1989, the Department of Health in the UK proposed "to make the Health Service more responsive to the needs of the patients by delegating power and responsibility to the local level" (Brown, 2003: 494), and again in 1993 the Department encouraged that changes be driven locally according to patient's needs (Brown, 2003). More recently and within the US, a Health in All Policies (HiAP) ordinance in Richmond, California was developed through fourteen community workshops from 2012 to 2013, where residents and community representatives explored how the city's policies and actions could reduce the community's greatest health stressors by applying a health lens to all decisions made by the city (Corburn, Curl, & Arredondo, 2014). The workshops included residents, community-based organizations, and representatives of the city, county, and school district. The Richmond city government committed to HiAP as a strategy to reverse the city's poor health outcomes and reduce health inequities by focusing on the social determinants of health, as directed by residents themselves, especially for people of color and those with low incomes. The results of such collaboration were self-rated improvements in health and satisfaction with where they live and the future of their community and city. By involving community members in decisions that will affect the broader built environment, various aspects of health at multiple levels can be addressed that will have real implications for the local population.

Part III: Rationale for a Case Study of Doctor's Medical Center Closure

Doctor's Medical Center, San Pablo (DMC) was a hospital in Northern California that opened as Brookside Hospital in 1954. Brookside, later DMC, was opened shortly after the formation of the West County Hospital District, located in the western part of Contra Costa County. DMC was the only hospital open to the public in West County; the other hospital in the area is Kaiser Richmond. Though DMC was located in San Pablo, a city of just under thirty thousand people, it also served the rest of West County, including the city of Richmond and its population of over one hundred thousand; in total, DMC was the main source of hospital-based care for over two hundred thousand people.

Although DMC was a for-profit district hospital, and was never a designated safety net hospital², it served a safety net population: up to 90% of its patient population were either publicly insured (Medi-Cal, Medicare, or dual-eligible) or uninsured, and the remainder were commercially insured. Unfortunately, Contra Costa County has one of the lowest Medi-Cal reimbursement rates in the state of California, which was a major difficulty for DMC and contributed greatly to its eventual closure. In addition, the population of Richmond – the major city of West County – has a significantly lower life expectancy and higher burden of chronic illness compared to the San Francisco Bay Area (Corburn, Curl, & Arredondo, 2014). West County is also racially and ethnically diverse, with over one-third of its population of Latino or Hispanic ethnicity, and 19.8% Asian, 17.7% African American, and 23% White (U.S Census Bureau, ACS 2014), and thus DMC's patient population was similarly diverse. Finally, the population of West County is relatively low-income compared to the rest of Contra Costa County and the San Francisco Bay Area: 33.7% of the population was below 200% FPL in 2014, compared to 24.8% in broader Contra Costa County, and the unemployment rate in West County was 10.7% compared to 9.8% county-wide.

While low reimbursement rates and a poor payer mix were significant causes of DMC's decades-long financial struggle, it had many other risk factors for closure that were discussed previously in this paper. DMC served a high proportion of low-income, racial and ethnic minority patients; it cared for a population with a high burden of complex chronic illness; and it was for-profit with high debt and low profit margins.

The population of West County, as well as some patients from elsewhere in Contra Costa and neighboring Alameda Counties, relied on DMC for a number of its unique services. It was the regional cancer center, so patients traveled from outside of the area for its cancer services; it had an award-winning stroke program and a helicopter pad; a busy cardiac catheterization lab; and dialysis services. Until the early 2000s, DMC had a burn unit and provided obstetrics care, but these services were closed as the hospital downgraded. The hospital's utilization was always high, as long as services remained open, but despite it being an important resource for West County and beyond, its financial losses persisted. DMC closed all of its medical services on April 21, 2015 after it was unable to secure long-term sources of funding, such as a new parcel tax, and failure to partner and merge with a larger system. As the nearest remaining hospitals are ten

² The safety net designation instead went to the County hospital, Contra Costa Regional Medical Center.

to twenty miles away, in an area with heavy road traffic, the closure of DMC has left over 200 thousand people without a full-service hospital that is open to the public.

The case study of the closure of DMC will explore the decision-making process of closing the facility and the impact the closure has had on various populations including physicians, employees, and patients. The aim is to better understand the specific challenges that the community faced during and since the closure, to bring forth what responses have been able to fill the healthcare gap, and what gaps still remain. This study addresses a gap in the literature of the psychological impact that hospital closure on employees, physicians, patients and community members. What is it like for a community to lose an iconic facility like a hospital? How do hospital and ED closure impact physical and psychological well-being in both the short and long term? This case study does not directly answer these two questions, but it approaches a closer understanding of individuals' responses to impending hospital closure, their methods of coping in the aftermath of the closure, and the adjustment to the new normal of limited healthcare access, greater travel times, and system-wide ripple effects.

Though West Contra Costa County is unique in its demographics, history and geography, the insights from this case study will be useful in informing other communities in California and the US that may be facing the closure of a safety net hospital. With recent and upcoming changes in the healthcare and political systems in the US, now is the time to better understand how the loss of a major healthcare facility affects individuals and communities to ensure that patients, especially in the safety net, will have access to high-quality medical care – of all services and specialties – in the future.

Original Research: What can we learn from hospital closure? A case study of Doctor's Medical Center

Abstract

Background: There is an epidemic of public safety-net hospital closures in the US. Doctor's Medical Center (DMC), a hospital in the San Francisco Bay Area, closed in 2015 due to lack of financial support. DMC was the sole safety net provider for an urban population of people of color with a high disease burden. DMC's closure is a useful case study of the successes and failures of hospital closures and safety net programs in the shifting healthcare system, especially the impact of hospital closure on an underserved community.

Methods: We conducted 37 semi-structured interviews with key informants (KIs) and community members (CMs) exploring events leading up to DMC's closure, the decision-making process, and the impact of the hospital's closure on the local community. KIs (n=12) were county officials and healthcare providers involved in DMC's closure. CMs (n=25) included previous patients and employees of DMC. Two investigators coded and analyzed the qualitative data.

Results: CMs describe DMC as a vital community resource with irreplaceable services, including the emergency department, catheterization lab, stroke program, and cancer center. Employees valued DMC's dedication to serving the community, regardless of ability to pay. Both groups were aware of the county's inability to prevent closure; CMs attributed local poverty and crime as primary reasons for the lack of investment in their healthcare system. Since DMC's closure, CMs express disempowerment and fear related to the loss, and cite additional barriers accessing healthcare, including geographical, transportation, insurance, and health education barriers.

Conclusions: DMC is just one example of many small community hospitals that are at risk of closure in the US. For underserved communities facing hospital closure, more considerations must be given to alleviating fears and ensuring the community continues to have adequate access to healthcare. This is especially true for the urban underserved who have no other options for hospital-based care, as seen with West County, where loss of the local hospital contributes to increased stress, fearfulness, and powerlessness. DMC's closure has caused widespread subjective delays in care, and delaying care can cause traumatic and costly end-stage disease complications. Furthermore, the closure was described as an emotionally traumatic event for the community of West County as it embodies the loss of public resources and structural violence that has affected the community for generations and represents a devaluation of their lives. Small safety-net hospitals must be better targeted by local, state, and federal support systems to ensure underserved community health needs are being met.

Introduction

Safety net hospitals provide a disproportionate share of healthcare services to vulnerable populations, which include uninsured and publicly insured, low-income individuals; Medicaid recipients; those living in medically underserved areas (MUAs); patients with special needs; immigrants; and more (Lewin & Altman, 2000). In the past four decades, stressors unique to safety net hospitals have increasingly threatened healthcare access for low-income urban populations (R. Y. Hsia et al., 2011; Ko & Needleman, 2012). More recently, small hospitals have closed in favor of bigger hospitals run by large healthcare systems that can leverage significant capital (Andrulis & Duchon, 2007), and more and more communities are losing their local hospitals. Urban public hospitals account for over 20% of emergency care, one-third of outpatient visits, 60% of burn care, and 36% of trauma care (Ko & Needleman, 2012), and the majority of these hospitals receive inadequate reimbursement for the costly and complex services they provide. This results in lower profit margins for many safety net hospitals, which threatens their long-term survival. The closures of such hospitals, which have spiked a number of times in recent history (Ko & Needleman, 2012) widens health disparities by further reducing access to care for vulnerable populations (Buchmueller et al., 2006; R. Y.-J. Hsia & Shen, 2011; Mobley et al., 2011).

People perceive increased barriers to accessing care in communities with more uninsured or Medicaid beneficiaries, a larger proportion of African American residents, and greater poverty – the quintessential safety net (Bindman et al., 1995). This was correlated with an increased rate of

preventable hospitalizations and poor health outcomes. If these vulnerable populations have low access to healthcare services at baseline, then safety net hospital closure must further exacerbate these challenges of access and poor health outcomes. Several studies have confirmed this phenomenon through various methods, including surveys, cross-sectional analyses, and qualitative interviewing (Adalja et al., 2011; Bindman et al., 1990; Countouris et al., 2014; Romero et al., 2012; Walker et al., 2011). Furthermore, neighboring populations are often impacted by hospital closure in other communities through substantial ripple effects that cause emergency department (ED) and in-patient overcrowding (Walker, Leng, et al., 2011). Finally, job loss for hospital employees is a significant effect of hospital closure and can be devastating to some communities' economic systems if there is not adequate preparation and support prior to closure (Havlovic & Bouthillette, 1998; Khosla et al., 2015).

Doctor's Medical Center (DMC) was a district hospital in San Pablo, California that, at the time of its closure on April 21, 2015, was the only hospital open to the public for an urban population of over two hundred thousand people. It neighbored a popular casino; the thriving casino beside what is now a deserted hospital building is a stark representation of how money is spent and how investments are made in this community. DMC served the patients of West County, a district of Contra Costa County. Although DMC was a for-profit district hospital, and was never a designated safety net hospital, it acted as a safety net provider: up to 90% of its patient population was either publicly insured (Medi-Cal, Medicare, or dual-eligible) or uninsured. To our knowledge, few studies have explored the impact of losing a vital component of the local healthcare system and built environment for a community that has historically been marginalized and repeatedly disenfranchised. Even fewer have explored this phenomenon through qualitative methods. Through a qualitative case study of the closure of DMC, we aimed to better understand how the closure of DMC has affected groups and individuals in West County.

Methods

This was a qualitative study that used in-depth interviews to explore the events leading up to the closure of DMC, and the impact of the hospital's closure on the local community. Interview participants fell into one of two groups: Key Informants (KIs) and Community Members (CMs). Qualitative methods are useful for exploring understudied phenomena and the experiences of individuals within a specific group. By understanding the perspective of key informants and community members alike, we aimed to learn lessons that can inform future policy decisions around hospital closure and survival.

Sample & Recruitment

CMs were adults who had lived and/or worked in West County since at least 2013 and included a subset of former DMC employees. KIs were county officials, administrators, physicians, and politicians who had been involved in preparing for DMC's closure and/or the closure decision-making process. Purposive sampling strategies were used to recruit the participants.

The KIs were included for their in-depth understanding of the hospital's history and closure process. CMs, who were mostly employees or patients, could provide unique insights into the experience of losing a local hospital. The participants who had been employed by DMC would provide the additional perspective of losing one's job with the closure of the hospital.

KI interviews were conducted first to identify the ongoing issues within West County's health system, clarify the timeline of events, and elucidate dimensions not visible to CMs. Interviewing in this order helped identify which CMs were ideal for inclusion in the study as well as additional questions to incorporate into CM interviews. Initial KIs were identified through DMC's website, the Contra Costa County website, and news articles, and they were contacted using publicly available information. Additional KIs were recruited through snowball sampling, where participants referred the investigator to other KIs who had been involved in the hospital closure decision-making and/or preparation processes. CMs were recruited from a local urgent care center, a free health clinic, and a senior and community center. Past DMC employees were recruited by recommendations from DMC healthcare providers (KIs) and through snowball sampling as described above.

Data Collection

All interviews were semi-structured, with separate interview guides used for KIs and CMs. Guides were revised through an iterative process where questions were added or removed as influenced by emerging themes. For example, KIs reflected on how health care in West County may evolve in the next decade, so a question about the region's future health care system was added to the interview guide after this theme presented in the first three interviews.

KI interviews began with questions about the history of DMC, especially the events leading up to its closure, its patient population, its services. KIs then discussed their involvement in decision-making and preparations. Finally, KIs were asked about their response to the hospital's closure, how the closure affected their work and personal lives, and how they envision the future of healthcare in West County.

CM interviews began broadly with a discussion of the participant's experience living in West County, including where they sought medical care (prior to and since DMC's closure) and their relationship with the hospital (whether they were a patient, employee, or both). Subsequent questions focused on the participant's response to DMC's closure, and the practical and emotional impacts this event has had on them and/or their family.

KI interviews were conducted from September 2016 to June 2017. The interviews lasted from 45 to 90 minutes and were conducted at the KI's office or by phone. CM interviews were conducted from January to June 2017, lasted 20 to 80 minutes, and were conducted at the CM's home or by phone. A total of thirty-five interviews were conducted, all by the student investigator in English or Spanish. Verbal informed consent was obtained prior to the interview. All interviews were

audio recorded and transcribed verbatim. Identifiers were then removed from transcripts to preserve confidentiality. At the end of the interview, the participant shared basic demographics with the investigator, such as race, age, and gender identity. CMs received \$30 gift cards at the end of the interview. KIs were not paid. Funding was provided by a thesis grant from the University of California, Berkeley's Joint Medical Program, and the study instruments and protocols were approved by the Center for the Protection of Human Subjects at UC Berkeley.

Analysis

All de-identified transcripts were imported into the qualitative software MAXQDA12 (VERBI GmbH) where they were organized, coded, and analyzed. Preliminary codebooks were developed by the investigator using sensitizing concepts, and were refined and expanded through coding the first five transcripts from each group. A student assistant with a qualitative methods background independently coded three transcripts from each group, and provided input on precision of the codebook. The investigator and assistant met regularly to compare codes and discussed any discrepancies until consensus was reached. After the codebook was finalized and agreed upon, the investigator independently coded all the remaining transcripts. Thematic saturation for the purpose of the research question was reached at 10 and 8 interviews for the KIs and CMs, respectively, as new themes ceased to emerge.

Results / Findings

Study Sample

Table 1. Sociodemographic characteristics of one-on-one interview participants, key informants and community members.

Demographic Variable	Value
<i>Key Informants (KIs)</i>	
Age	
Range	44-71 years
Mean	59.5 years
Years working in CCC	
Range	12-58 years
Mean	32 years
Race/ethnicity	
White	9 (75%)
Black	2 (17%)
Latino/a	1 (8%)
Gender	
Male	8 (67%)
Female	4 (33%)
<i>Community Members (CMs)</i>	
Age	
Range	30-85 years
Mean	59.8 years
Years living or working in CCC	
Range	3-80 years
Mean	31.2 years
Race/ethnicity	
White	14 (58%)
Latino/a	4 (17%)
Asian/Pacific Islander	3 (12.5%)
Black	3 (12.5%)
Gender	
Female	19 (79%)
Male	5 (21%)

The Resource Desert of West County

In interviews, KIs and CMs both shared the experience of living and/or working in West County. KIs described that West County as a low-income, underserved, working-class community that “doesn’t seem to have much identity,” is demographically distinct from the rest of the county, and has a high burden of chronic illness and violence compared to other geographic regions in the SF Bay Area. While West County had once been home to at least three hospitals that served the public, a series of closures left DMC as the sole provider in the region. These repeated hospital closures are examples of a broader lack of investment in this community, which contributes to chronic stress and is an example of a structural process that causes disease and poor health (Geronimus, 2013). West County is geographically isolated from the rest of Contra Costa County, with a fragmented public transportation system connecting West County to the county hospital (“Martinez”) 10 miles away.

Former DMC employees (CMs) especially emphasized West County’s geographic and demographic isolation. They felt that their community is viewed as a burden to the rest of the county because of the area’s poverty, violence, high proportion of minority and immigrant residents, and high burden of chronic disease. These participants felt that county officials and politicians resent West County, and thus are less willing to provide support for public services like a hospital.

Because you know – as a resident here, you know, I mean, we are still the poorest city in Contra Costa County. So that’s San Pablo. That’s where the hospital is. I still look at that as, you know there is really no money for poor people. I mean ... we are always an afterthought, we only get thought of if you are running for election, then I want your votes. [Community Member, former employee]

KIs and CMs described the health of residents in West County as particularly poor compared to other populations in the county and the greater Bay Area. KIs overwhelmingly described West County as a sick population, and many informants acknowledged the overwhelming confluence of being low-income, having a chronic illness, and facing barriers to accessing healthcare. As one healthcare provider said, “These people are sick. They are the people in greatest need, and they are the people that have the least access to care.” Even when DMC was open, KIs were concerned about West County residents’ poor health and limited access to healthcare. KIs recognized that for residents with end-stage disease and/or exposure to violence, having access to a hospital like DMC was a matter of life or death. Few residents had access to other hospitals in the Bay Area due to a combination of barriers including insurance status, access to transportation, language, familiarity with the regional system, and disability. One public official described how they view the average West County resident: “...in general, we’re talking about people who have diabetes and they attempted suicide and they have an alcohol problem and they’re not walking and there’s mental status issues and there’s no family.”

Through personal experience of caring for themselves or family, and as healthcare workers caring for patients in the community, CM anecdotes supported KI descriptions of West County as a sick community. Some respondents attributed the community's poor health to their lack of resources, and CMs often pointed to systemic discrimination and racism as reasons for the lack of investment in their community. Other CMs mentioned insurance as a predominant barrier to healthcare for West County residents. They argued that uninsured patients wait until their disease is severe and requiring life-saving measures before they seek care, which contributes to poor health outcomes and greater medical expenses. Former DMC employees explained West County's burden of illness by comparing their community to others in the Bay Area. At the time of interview, many former employees were working at other hospitals in the Bay Area, and they explained that the patients they had cared for at DMC were, in general, more severely ill or injured compared to patients at other hospitals from different communities in the region.

I saw people come in, they were 90 percent burned, yelling as they come in, I saw a lot, I saw a lot. I mean there's a lot more, what do you call...traumas there, in this area, than I was able to witness at the other facility that I was working at. I'd never experience what I experienced there [at DMC] at other facilities.
[Community Member, former employee]

West County is home to a geographically isolated, urban population that struggles from a lack of investment in public resources, including healthcare, and this has had a negative impact on the community's health and wellbeing. DMC was the only hospital in the area that was open to the public prior to its closure, and has left a large patient population stranded, without convenient access to hospital services, which KIs and CMs fear will exacerbate poor health outcomes and contribute to greater health expenses.

DMC: The Only Last Resort

The combination of poor access to primary care and a high burden of chronic and traumatic illness among West County residents added up to heavy use of the hospital's emergency department (ED) for both primary and emergency care. The ED at DMC was cited frequently as having been one of the hospital's most important resources for patients in West County. DMC was home to over half of ED beds in West County (25 of 45 beds), and while it cared for many true emergencies, it also provided a substantial amount of primary care. KIs explained that DMC's ED admitted an unusually high percentage of patients, and that it sustained heavy trauma traffic. In addition, the community relied upon the ED as a source of primary care, which CMs themselves noted: "That's the problem with Doctor's Hospital [DMC] is, we have such a huge amount of uninsured in the area. They can't make it to the county hospital, they use [DMC's] emergency room for everything."

In addition to its ED, DMC offered a variety of services that were not offered elsewhere in the region, in particular its cardiac catheterization lab and award-winning stroke program. Occasionally, patients outside of West County were transferred to DMC for these unique

services. Some participants, especially healthcare providers and former employees, could not imagine where patients were receiving these unique, essential services that DMC had supplied.

Our county does not have a lot of the services. [...] New dialysis patients came to us; a lot of their [the county's] heart patients came to us; and also, cancer patients. I mean, as far as our heart program, because I was the one that other hospitals would call to transfer a patient [...] we took care of all their STEMIs [ST-elevation myocardial infarctions], we took care of all their caths [cardiac catheterizations], and we got referrals from five or six hospitals in a given day... Where are all those people going now? [Community Member, former employee]

While both KIs and CMs explained DMC's importance to the community in terms of the services it offered, CMs also focused on the hospital's meaning to them personally and the sense of ownership they felt over the hospital. DMC was their community hospital, dedicated to caring for any patient regardless of ability to pay. It was an iconic part of the community and of many family histories, including stories of giving birth at DMC. One CM described the community's sense of ownership over DMC and their family's reliance on the hospital: "I would always go there when I was sick, I would go there, and also my husband. That is our hospital." Many families felt reassured by DMC's presence within their community as a reliable source of care, either emergency or primary, for themselves and their loved ones.

DMC was a vital source of healthcare and a symbol of community investment in West County. It provided many services that were not otherwise available in the area and were tailored to the needs of its patient population, and its ED was particularly important to the community. DMC was symbolic: CMs felt that their community was being cared for as long as DMC was open, and were comforted by having a system of last resort that was close at hand, familiar, and had not let them down in their times of need.

A Commitment to Healthcare for All

Another aspect of DMC's importance within West County was the dedication of the hospital's providers, staff, and administration to providing healthcare services regardless of insurance status. While this is true of any ED in the US according to the Emergency Medical Treatment and Labor Act (EMTALA), CMs felt reassured that they could receive services at DMC without fear of being turned away for insurance reasons or left with bills they could not pay. As a former employee explained, "[At] DMC, we knew automatically they couldn't pay. We knew that. We were going around it, trying to figure out how we can get those reimbursements back." DMC was committed to serving the local population with whatever resources were available, and its dedication allowed people to feel supported and reassured that they would be cared for.

Former DMC employees described their commitment to serving the population of West County, which included their own families and neighbors. One employee described her personal mission to serve the community of West County: "For me, I grew up in the community. I grew up in San

Pablo, and San Pablo was different than it is now, granted, but still, it's my community. I still live 10 minutes away, but we all chose to work there because we all did enjoy taking care [of] the particular population." Another explained that the employees' dedication to the hospital and the community was "not just because it was their paycheck," but rather a commitment to providing accessible healthcare services to an underserved population. Patients' descriptions of DMC employees and providers supported employees' own assertions of dedication:

That was—you could feel it in that hospital, that that was the calling of everyone, from the top surgeon down to the person sitting up the reception desk. They were not just putting in their time punching their cards, they really, really believed in that hospital's mission. [Community Member, patient].

Former employees recalled the challenge of working in a hospital with limited resources, and as closure approached, employees were forced to work with less. Employees describe the sacrifices they made, including taking pay cuts and giving up shifts to prevent lay-offs, so that they could help keep the hospital open and continue to serve their community. As units closed and fewer services were offered, employees worked to provide what services they were able. "I'm not saying every single person was the best or anything, but there was a lot of people working really hard to keep that place open and not just because it was their paycheck," explained one employee. It was the cumulative dedication and commitment to service, rather than the accomplishments of any individual or availability of cutting-edge technology, that made DMC a special and vital service within West County.

A Frustrated, Fearful, and Forgotten Community

CMs expressed sadness and frustration about DMC's closure throughout their interviews, and many explained that their disappointment was still palpable two years after DMC closed. CMs speculated that others in the community were worried about accessing health services, especially emergency services. They overwhelmingly felt that their community would be better off if DMC had remained open, and felt disempowered by its closure, which is yet another public resource of which they've been denied. "What a shame," said one CM about the closure, "San Pablo doesn't have a lot, they really don't." Frustration was often fueled by CMs' feelings of powerlessness and others' indifference for their community's wellbeing:

"And that's what's most disturbing about the fact that [DMC] couldn't be saved. It could have been saved! That's the most disturbing thing, is that it could have been saved. But nobody gives a shit about poor people and their neighborhoods, nobody who has the money, really, and the power." [Community Member, patient]

Outbursts of frustration were not uncommon during interviews, especially when discussing CMs' responses to DMC's closure. The frustration was most often directed at undefined entities ("they") with power and decision-making responsibility. CMs were not sure who to blame, as the

hospital's closure cannot be attributed to an individual or a group, which likely contributed to CMs' sense of powerlessness and expressions of anger. Occasionally, CMs named public officials or hospital administrators as causative agents, but in general CMs felt they were at the mercy of larger structural forces with no single, visible culprit.

Some CMs described DMC's closure with powerful descriptors like "devastating," "tragedy," and "tremendous loss." DMC's closure was and continues to be an exceptionally detrimental event to CMs and their community. When reflecting on DMC's closure, a patient described, "Really, for the people in this area, losing Doctor's Hospital was really – you've got to say, a tragedy. There were so many people that relied on it for their care." At the time of interview, just over two years after DMC's closure, these CMs were still upset – some to the point of tears – about the loss of their community hospital, which implied that there may not have been enough change in the local healthcare system to make up for what was lost.

Growing fear and uncertainty were predominant consequences of DMC's closure, especially among those who had been patients at DMC and the employees who had cared for them. Losing DMC's ED was often cited as the predominant driver of increased fear, as CMs worried about timely access to an ED in case of an emergency. Following the hospital's closure, CMs realized the degree to which DMC's ED had reassured them and their families, and without a public ED in their community they have become fearful of poor outcomes and even death. One patient even described how her uncertainty has caused palpable psychological distress:

Now it's a bit more difficult, because now I'm constantly having anxiety attacks, now I feel more fearful because before, if something happened to me, the hospital was right here nearby. Now that it's not there I'm worried, because I'm a bit isolated from Martinez [the county hospital]. I have heart problems, and sometimes I'm scared because I feel like I'm having a heart attack, and I worry that if I have to go to Martinez, what if I die on the way? [Community member, patient]

CMs often shared anecdotes of family or friends whose survival from an accident or medical emergency was attributed to DMC's presence and convenience within the community. One participant insisted that the proximity of DMC saved her sister-in-law's life: "Because the doctor said that if she had been even a little bit further away, she would have died. But thanks to the hospital being so close, they were able to save her..." Through such stories, CMs expressed their ongoing concerns for the health of themselves and their families in the wake of DMC's closure. CMs were most often fearful of having to travel farther away to access emergency services, while others worried about how they would get to a hospital without risking an expensive ambulance bill.

The physical building that once housed DMC has been a constant reminder of the lack of investment in healthcare in the community. "Why is it just standing there like that?" wondered

one patient, who wished that the building would be put to use. That the building has remained empty for so long is further proof to CMs that the community of West County is not attractive to investors. One CM explained how the presence of the unused hospital building as a distressing reminder that West County is underserved: “I miss it, I miss it terribly, it’s just a constant reminder when I look at it, at what could have still been, and it is like a slap into people’s face, in the community, just looking [at] it standing there and nothing’s going on.” Another CM described the tears that fill her eyes every time she drives past the building. Many CMs see the empty facility as a reminder of their community’s and county’s inability to support a full-service hospital that had been a critical resource for decades, and whose loss has caused emotional upheaval. The loss of DMC has meant the loss of a critical source of healthcare, and has left an underserved community feeling isolated, powerless, and abandoned.

Unlike CMs, KIs rarely shared their own emotional response to DMC’s closure, and instead speculated about the impact that the hospital’s closure has had on the community’s wellbeing. Healthcare providers were the only KIs who did share their emotional reactions, while public officials shared the responses they witnessed within the community. Healthcare providers described feeling frustrated and saddened by DMC’s closure. “I was just pissed off, I was totally angry,” said one healthcare provider, and another lamented, “When a hospital closes, you know, that hurts a lot, it hurts.” Healthcare providers, who saw firsthand the impact of DMC’s closure on their patients, mirrored their patients’ frustrations and sadness in their own reactions to DMC’s closure.

Public officials tended to share the responses to DMC’s closure that they witnessed within the community, rather than describing their own emotional or psychological reactions. These informants were aware of the loss, frustration, and fear felt among West County residents. One public official astutely noted the community’s fear of losing their local ED: “Everybody was talking about how people are going to die, and they can’t do this, they can’t close our hospital after all these years. It was a real sense of loss and grief from them.”

An Avoidable Tragedy

Participants shared their thoughts of how DMC could have been better supported and which entities they held responsible for its closure. While healthcare providers felt that county and district officials had failed the community, public officials tended to blame a system rather than individuals. Some informants even felt they had personally failed the community by not doing enough to prevent DMC’s closure. One public official described his/her regret that DMC closed, despite all efforts made by him/her and others to support the hospital: “So, I felt really disappointed and I felt really... after all this work to try to keep it open, that you know, we had failed, knowing that we’re up against a really tough system.”

Many KIs explicitly held the county and/or the state responsible for DMC’s closure because of their refusal to provide sufficient support to keep the hospital open long-term. These KIs argued that the county and state were not invested in the community’s wellbeing, as evidenced by their

apparent unwillingness to pass measures or provide funds that would sustain the hospital long-term. As one KI explained, “Everybody tries to figure out who to blame. And I think the blame needs to fall on the county and just the whole medical system and how it handles taking care of the poor.” This informant specifically held the county responsible, and in addition mentioned that the “whole medical system” – whether county, state, or national – is also responsible for DMC’s closure and, more broadly, for failing to adequately care for “the poor.” Another KI argued that, given this poorer treatment of low-income populations, it was no surprise that DMC closed: “All of this was easily predictable. I would say that no one cared. Absolutely no one cared.” CMs also cited the county as an entity that should have been held more responsible for supporting the health system in West County by preventing DMC’s closure. One CM said about the county, “Well, they weren’t doing their job because they were not providing healthcare for the entire county.” CMs felt abandoned by their own governmental body, who they believed had shirked their responsibility in failing to keep their community hospital open.

Private health systems were held accountable by KIs who reasoned that these systems have pulled private payers out of West County, leaving DMC to struggle with insufficient reimbursement. While some KIs pointed out that these entities did provide financial support to DMC over many years, others argued that private health systems should be held more responsible for contributing to the closure of smaller hospitals like DMC. CMs, however, were less likely to blame private systems, and instead tended to express appreciation that other hospitals in the region have absorbed West County patients.

Informants were divided with regards to the community’s responsibility for maintaining its own healthcare system. Some KIs felt that too much responsibility had been placed on the community to support its own healthcare system. These KIs believed that low-income, underserved communities should not be expected to be fully self-sustaining, and outside support is necessary to provide essential public services such as healthcare. However, these informants and others also noted that health districts like West County are, by definition, created and supported by taxpayers in the community. To what degree the community should support its own healthcare system, and when outside support is required, was at the core of many KIs’ concerns and their continued unease with the situation. West County had the unique circumstance of being a low-income health district with its own hospital that suffered from private payer competition and existed in a county with some of the lowest reimbursement rates in the county. CMs, on the other hand, were less often aware of the taxpayer’s role, though one CM argued that, “everybody here, people don’t have enough money, so they had to let it [DMC] go.” This CM, like many KIs, was aware of the challenge and irony of expecting a low-income community to support a failing hospital.

New Barriers Exacerbate West County’s Isolation

Increased distance to the nearest hospital, transportation challenges, and unfamiliarity with the regional healthcare system have presented as new barriers to accessing healthcare services for the residents of West County. With no public transportation system directly connecting San

Pablo to the county hospital (Martinez) over 15 miles away, patients without access to a private vehicle must rely on friends and family. Those with the means to drive themselves face traffic and unfamiliar settings. These barriers have caused persistent stress, delays in care, and new challenges when caring for family and self.

CMs discussed the stress that DMC's closure has caused and continues to cause two years later. One patient recounted a recent event where her son became sick in the middle of the night, and when she took him to the nearest ER, the wait time was so long that she was advised to go to the county hospital instead. "It was ... so late at night, and when your kid's crying and in pain and the closest hospital cannot take him ... it's stressing," she explained, adding that her entire family had relied on DMC for their health needs, and now were not sure where to go for their care. In addition to the stress of going to an unfamiliar hospital far away, the ripple effect caused by DMC's closure has translated to subjective delays in care, and heightened anxiety and uncertainty about access. For routine services and non-emergencies, CMs emphasized the challenge of going elsewhere for their care.

CMs asserted that transportation was the main barrier to healthcare for West County patients and families. When DMC was open, patients were confident in their ability to get to the hospital, whether by public transit, taxi, a ride from family, or even on foot. Traveling to the nearest hospital now takes upwards of an hour with traffic. Even those with private vehicles are frustrated by the time and distance between their home and a hospital, especially considering they live in an urban area that, less than a decade ago, was home to multiple public hospitals. "A lot of my neighbors that live here, they just don't like having to travel a distance to have to go get certain tests done when they feel that they should be able to get it done right there at Doctor's," explained one participant, and many others expressed similar discontentment.

While most CMs were uncertain about *how* they would get to a hospital, some were also unsure about *where* they should or could go for hospital services. CMs felt their options have become incredibly limited, especially those with Medi-Cal or no insurance. One uninsured CM explained, "It's more difficult [now] because the hospital isn't here anymore, because I knew that someone without insurance could still go there, and they would help." Many CMs were hesitant to travel far away without the certainty that they would receive care. Even a former DMC employee, who was medically insured and familiar with the regional healthcare system, was unsure about where to get their care: "I mean, it's in my face all the time because if you have a medical problem, then the question is, where do I go? Where is the best place to go at this point?" The consequences of these barriers to accessing healthcare – transportation, uncertainty, and unfamiliarity with the greater healthcare system – have contributed to subjective delays in care for patients and their families. For a community with a high burden of chronic illness, delays in care are only going to cause further harm.

KIs acknowledged the transportation challenges and lack of access to ED and hospital services. Informants cited the loss of the ED as having the greatest impact on West County patients. As one public official explained, "The most important part of that hospital was not the hospital

beds, it was the emergency room. What this area is lacking substantially now is an emergency room for the public.” Some KIs shared anecdotes of poor outcomes among West County patients, which they attributed to the increased distance and travel time to the nearest ED, and to low-income and uninsured patients’ unwillingness to call an ambulance for fear of an expensive bill.

KIs also recognized the challenges posed by insurance status. It is more difficult for West County patients to access hospital services because many Bay Area hospitals are unwilling to accept Medi-Cal patients and will not go out of their way to take responsibility for these patients’ care. In contrast, there was one outlying opinion expressed by an administrator who felt that other healthcare systems in the area “certainly changed how they operate and they’ve worked very hard to meet the community’s needs.” While most KIs felt that hospitals and specialist groups have not done enough to make their services available to abandoned West County patients, one KI felt that other hospitals have appropriately responded to patients’ needs in the wake of DMC’s closure.

As a result of lost services requiring patients to travel farther for care, maintaining continuity of care has become a major challenge. Healthcare providers were among the most frustrated about disruptions in continuity of care, possibly because they know from experience that poor continuity is detrimental to patients and providers alike. Previously, patients who had received services at DMC were able to follow up at the hospital or nearby, as they did not have to travel far – everything was local. Now, patients receiving hospital-based services farther away may be expected to return for follow-up. With transportation as a known barrier, providers speculated that maintaining follow-up is challenging, if not impossible, for many patients. This aligns with CMs’ tales of delaying care because of transportation and other logistical challenges. These new barriers to care, though minor for more advantaged populations, introduce a great burden within West County and will likely have long-term health and economic impacts for this large underserved community.

Conclusions and Implications

This study of the closure of an urban hospital in the San Francisco Bay Area provides important insights into the effects of hospital closure on communities, and the specific challenges faced by patients, families, healthcare providers, and decision-makers. In-depth, one-on-one interviews were conducted with community members and key informants in order to gather detailed accounts of the hospital’s importance to the community, individuals’ experiences with hospital closure, and ongoing challenges as a result of new barriers to healthcare access.

Just prior to its closure, DMC was the only hospital in West County that was open to the public. It provided essential services for a large population of low-income people of color with a high burden of chronic illness and exposure to violence. The hospital was home to over half of the ED beds in the district, an award-winning stroke program, the only cardiac catheterization lab in the area, and the regional cancer center. In interviews, patients highlighted the hospital employees’

and providers' dedication to serving the local community, regardless of a patient's ability to pay. When discussing the impact of DMC's closure, community members expressed abandonment, disempowerment, loss of control, and fear. These individuals vividly expressed the emotional impact of the hospital's closure and the stress it has introduced into their lives. Local healthcare providers were also upset and frustrated, and argued that it was unfair to close such an important service for this vulnerable population. Informants held the county and state responsible for failing to provide adequate support to maintain the hospital, and felt they personally had failed the community, as well. Transportation issues and increased distance to a hospital have presented as new and overwhelming barriers to accessing healthcare services, which has caused subjective delays in care.

While there have been many studies measuring the impact of hospital closure quantitatively, including factors that put hospitals at risk of closure and studies of patient outcomes following closure (Adalja et al., 2011; Bindman et al., 1990; Countouris et al., 2014; Romero et al., 2012; Walker et al., 2011), few qualitative studies have been conducted on this topic. The results of this study align with other studies that have also reported challenges with healthcare access for communities that have experienced hospital closure, including transportation issues, lack of familiarity with other systems, and the anxiety caused by uncertainty (Walker et al., 2011; Romero et al., 2012; Adalja et al., 2011; Countouris et al., 2013). This study contributes to the literature as an exploration of an underserved urban community's perception of hospital closure and its impact, specifically in terms of the emotional burden felt by community members and subjective changes in access to healthcare services. To the community of West County, DMC's closure was a reminder of the structural and systemic inequalities that this population has historically endured. Hospitals, perhaps even more so than other public amenities, may serve as markers of whether or not a community feels "cared for," both in terms of provision of health services, and figuratively in terms of worthiness. This appears to be especially true in the context of the loss of a sole provider, as DMC was the only hospital open to the public in West County prior to its closure. When an underserved community is deprived of the ultimate safety net, as DMC represented in West County, there can be profound emotional effects that manifest as anger, fear, and loss of control. Repeated denial of public goods, such as the loss of multiple hospitals over a few decades (as occurred in West County), serves as a recurrent reminder of existing systemic inequalities that have real effects on individual wellbeing. This contributes to repeated stress, which has been shown to cause disease and ill health (Geronimus, 2013).

The study results have implications for future research, hospital closure practices, and health policy. These results suggest that a hospital closure has significant emotional impacts on community members, which appeared to persist at 18-24 months after the event. One community member even described debilitating panic attacks that were attributed to the hospital's closure and uncertainty around where to go for emergency services. DMC's closure exacerbated a vulnerable population's feelings of powerlessness and insignificance to local and state powers, who they believed had abandoned their community. Future research may investigate the extent to which hospital closure, or the loss of another equally vital community service, is a traumatic event for vulnerable populations and individuals, and how repeated losses

of public services may affect a community in a similar way as repeated traumatic events affect individuals. Additional research should also address the economic impact of hospital closure: how does hospital closure contribute to delays in care that cause avoidable complications and disease progression, and thus more expensive medical interventions?

There are several limitations and strengths of this study. Semi-structured qualitative interviews can be subject to respondent and researcher bias, which we attempted to minimize through a second investigator's review and coding of the data. The considerable amount of data collected from in-depth one-on-one interviews limits the study sample size, which thus limits our ability to claim that the study population is representative of the community of West County. Furthermore, the majority (76%) of community member respondents were female and over half were white (58%), while the population of West County is only 23% white. Additionally, most community member participants were older adults, with an average age of 60 years; this may be a result of the locations chosen for recruitment, which included the San Pablo senior center. Several participants referred others to the study, especially prior DMC employees (a subset of the community member group) and several key informants, thus some participants may have shared similar views to previous participants. Data were collected between 18 and 24 months after the hospital's closure, and participants' accounts may have been more emotionally charged, and events and responses more easily recalled, had interviews been conducted sooner after the event. The richness of the data gathered from one-on-one interviews with various groups, from the patients themselves to employees to public officials and decision-makers, provides insight into these individuals' and groups' experiences of hospital closure in a way that other methods, such as surveys, cannot. We do not believe that any major perspectives or issues were missed because thematic saturation was achieved.

The current trend in hospital systems in the U.S. is moving away from small, community hospitals towards larger health systems with a focus on outpatient care. As the U.S. healthcare system undergoes major changes, it is essential that we provide more support to safety net hospitals serving underserved communities, with special attention to those in smaller communities that are not part of larger health systems. We must do better to target the country's most underserved communities and ensure that their specific health service needs are being met, which may require additional support for the local healthcare system, especially if the core of that healthcare system is a single safety-net community hospital like DMC.

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