

美国医疗水平欠发达地区的社区门诊设计案例研究

COMMUNITY HEALTH CENTERS FOR THE MEDICALLY UNDERSERVED: AN AMERICAN CASE STUDY

斯蒂芬·魏德勃 | Stephen Verderber

翻译: 姜珊 | Translated by Jiang Shan 校审: 肖雁文 江宇 | Proofed by Xiao Yanwen & Jiang Yu

摘要 本文以近期两个社区门诊项目为例, 探讨美国医疗建筑循证规划与设计实践。这两个项目是美国路易斯安那州进行20年的研究成果体现, 并对该州医疗设施改善计划总计65处设施规划和建筑设计改建产生影响。

关键词 社区健康 门诊医疗 居住区环境 循证规划与设计 医疗水平欠发达地区

Abstract An American case study in evidence-based research and design is discussed. Two recent outpatient clinics are presented. These examples express the outcome of a program that has been in operation for twenty years and has influenced the facility planning and building design of sixty-five capital improvement projects in the state of Louisiana.

Keywords Community health, Outpatient healthcare, Residential image and ambiance, Evidence-based research and design, Medically underserved

Introduction

Outpatient community-based care is critical to the overall success of the United States' healthcare system. A network of local, state, and federal health agencies endeavor to serve the Nation's diverse population. At present, more than 48 million Americans do not have health insurance. Historically, most of these persons reside in medically underserved communities. These persons and places tend to suffer from insufficient access to nearby clinics or hospitals.¹ The lack of access to adequate primary care and disease prevention care forces these persons, who are often poor, to travel far distances to receive far more expensive diagnosis and treatment. More intensive healthcare is sought out elsewhere when prevention-centered local options are few. Hospital care is far more costly and is the usually the result of the condition not being treated earlier.² Later-stage illness diagnosis and treatment often requires emergency room care. Even worse, many patients and families, lacking the means of transport such as a private family car, or good rail transport, by default, may fall entirely out of the healthcare equation and opt to not seek out any sort of care at all.³

In the United States, more than two-thirds of all outpatient clinics for the medically underserved are located in rural communities. Most are located far from urban centers. The physical environment of this national network is uneven in quality, architecturally.⁴ The core dilemma facing care providers at this time—especially in the public, not-for-profit governmental sector of the American healthcare industry—is the prevalence of too many poor quality facilities.⁵ The lack of high quality facilities is reaching a crisis point. This is particularly true for clinics that provide care for the medically underserved.⁶ A physician or nurse might be forced to work in a poorly planned and poorly maintained freestanding outpatient clinic for decades.⁷

The federal Medicaid program was created in 1965 by the U.S. Congress, for Americans without private health insurance.⁸ In 2010, the administration of President Barack

前言

以社区为单位的门诊医疗服务(下文简称社区门诊)是美国医疗系统的重要组成部分。联邦、州和县郡的各级医疗部门协同合作, 以服务美国多样化的人群。目前, 尚有超过4 800万美国公民没有参加医疗保险, 其中绝大部分人居住在医疗水平欠发达地区,^[1] 处于周边医疗设施不足境地。由于缺乏便捷的初级治疗和足够的疾病预防工作, 这一人群不得不前往距离较远的医院就诊, 更加大了医疗成本。因为以预防为目标的当地医疗设施极少, 他们只能去综合医院寻求帮助, 医疗费用对他们来说变得无法负担。以至于疾病常常被拖延, 不能得到尽早治疗,^[2] 晚期疾病的诊断常常需要急诊或者重症监护治疗。^[3] 更糟糕的是, 许多病人与家庭因为缺乏交通工具, 例如没有私家车或者便捷的轨道交通, 可能陷入更糟糕的境地——干脆放弃就医。

在美国, 为医疗欠发达地区服务的门诊设施有超过2/3位于乡村社区, 其中绝大部分远离城市中心区。即便在这个系统里, 医疗建筑的环境质量也良莠不齐。^[4] 当下医疗部门, 尤其是非营利性政府公共医疗部门面临的最主要问题正是大量低质量医疗环境的泛滥。^[5] 缺乏高质量医疗环境已是燃眉之急。这一问题在医疗水平欠发达地区尤为突出,^[6] 医护人员可能不得不在设计和维护很差的门诊医院工作数十年。^[7]

1965年, 美国国会通过了贫困家庭医疗援助法(Medicaid, 见译者注¹), 旨在为缺乏私人医疗保险

Obama approved new national healthcare-access legislation. This new legislation, the federal Affordable Care Act of 2010, will provide healthcare coverage, beginning in 2014, to more than 31 million Americans (of the 48 million total) who at present remain uninsured. With the ACA's full implementation coming in 2014, concerns are growing over the fact that these previously uninsured patients will quickly overwhelm the nation's existing medical centers, stand-alone hospitals, and community-based outpatient clinics.⁹

With these millions of previously uninsured patients about to enter the nation's healthcare system, the burden placed on the nation's network of outpatient community clinics in particular will be grater than ever before. The worst of the poorest quality facilities will experience complete breakdown. Many merely limp along, particularly those located in the heart of economically disadvantaged communities. Without adequate funding, these clinics will only fall into further decay and decline. A situation persists where, sadly, no national database on this physical inventory exists as of yet. The need for such an inventory and knowledge repository is great and will only increase when the ACA is fully implemented in 2014.¹⁰ The goal of the following discussion is to present a strategy on how to improve the architectural and functional quality of this national network of freestanding outpatient primary care and public health clinics.

Evidence-based Facility Planning and Design

The ACA will provide \$11 billion to bolster and expand the U.S. inventory of outpatient community health centers, beginning on January 1, 2014.; \$9.5 billion will be earmarked to construct new health center facilities specifically in medically underserved areas, and to specifically expand preventive and primary health care services in these communities. This includes an expansion of dental and behavioral health services.¹¹ Evidence-based research and design, or EBR&D, can and should guide any current and future investments in this system. Few individual states or local towns, however, have established performance-based, i.e. evidence-based, facility planning or architectural minimum policies or standards for outpatient community health centers that reach beyond the most basic national building code-requirements. Evidence-based research and design (EBR&D) for health extends beyond building codes per se, and is defined as the systematic documentation and analysis of empirical data that then is translated into facility planning and design. The post occupancy evaluation, or POE, in this regard, is capable of empowering care providers in helping them learn what works and what does not work in a given healthcare facility.¹² The post occupancy evaluation can yield many positive outcomes of great value to healthcare providers. This information is compliant with but yet extends beyond codes to include issues of patient and staff flow, user needs and references, and strategies to reduce occupants' environmental stress.¹³ The POE can be of great help to architects and to medical planners.¹⁴ The emerging field of EBR&D in healthcare architecture is just beginning to blossom as it gains momentum, acceptance, funding, and increased sponsorship by the federal government and by private philanthropic foundations.¹⁵ Scant EBR&D in the U.S. has been completed that is centered on outpatient freestanding primary care settings.¹⁶

The State of Louisiana has achieved success over the past two decades in its quest to replace the majority of its publicly-operated freestanding community-based outpatient clinics. This has occurred over a twenty-one year period, and this program has been centered on EBR&D. It has been paid for and supported by Louisiana's statewide health and hospitals agency. In the fall of 1990, the State of Louisiana Department of Health and Hospitals' Office of Public Health (DHH-OPH) embarked upon (under the first author's direction in the role of consultant) a strategic, evidence-based healthcare facility improvement program. This effort, the Strategic Facility Improvement Initiative, or SFI,

的贫困人群提供援助和保障。¹⁰2010年,奥巴马政府推动出台了新的国家医疗法案——《患者保护与平价医疗法案》(Affordable Care Act of 2012),也称奥巴马医改(Obamacare) 预计从2014年起,它将为总计4 800万未参保公民中超过3 100万人提供医疗保障。¹¹因为医疗法案将在2014年完全生效,人们担忧此前未参保的病人将很快挤满全国各级医疗设施,包括现有的医疗中心、独立的医院以及社区门诊

随着数百万计的人即将被纳入保险范围,社区门诊的负担将会迅速加重。质 最差的一批医疗设施将全面崩溃。即便有些位于经济欠发达社区里的诊所能够艰难维持 倘若没有足够的资金支持,最终也将衰退,遗憾的是,美国一直没有建立这些医疗设施的数据库。对这一数据库的需求将会越来越明显,尤其是奥巴马医改在2014年生效之后。¹²本文将讨论如何提高全国医疗网络中那些独立的基础医疗与公共社区门诊的建筑与功能品质

医疗设施的循证规划与设计

在自2014年1月1日起未来的5年内,奥巴马医改将提供11亿美元以扩展美国社区门诊服务,其中9.5亿美元将用来建设新的医疗中心(尤其在医疗水平欠发达地区) 并重点推广社区级别的“预防性治疗”和基础医疗,包括牙科和行为健康服务。¹¹循证研究和循证设计(Evidence-Based Research and Design,简称EBR&D,见译者注²)在当今以及未来的医疗系统发展中都应当并且的确会起到指导性作用,但是目前却很少有州、县郡为社区门诊建立比国家规范更严格的基于使用性能的(如循证设计的)规范或建筑标准 以满足社区门诊的建设需求。医疗建筑的循证规划与设计超越了单纯的建筑规范 是基于经验数据的系统记录与分析整理而形成的指导规划与设计的准则 使用状况评估(简称POE)可以帮助医疗机构了解所属设施各个部分是否合理有效¹²能够为医疗机构提供具有极高价值的反馈信息,符合规范且又比规范更进一步,例如评估病人与医护人员的交通流线,使用者的特殊需求和偏好以及考虑如何设计才能有效缓解医院环境给病人带来的压力¹³POE可以为建筑师和医疗规划师提供帮助。¹⁴在美国,医疗建筑的循证规划与设计方兴未艾,随着社会对此的接纳和需求以及联邦政府和私人慈善机构的资金支持,这一课题正在成为热门¹⁵但相比之下,以社区门诊等基础医疗设施为对象的EBR&D研究目前却很少¹⁶

美国路易斯安那州正在过去的二十余年中快速更新以公有社区诊所为主的医疗设施 并取得很大成功 在这21年中EBR&D起到了关键作用,其研究经费由路易斯安那州的医疗卫生机构提供。1990年秋季,在笔者以顾问身份的指导下,路易斯安那州公共健康及医疗卫生办公室(Department of Health and Hospitals' Office of Public Health 简称DHH-OPH)开启了这项以循证设计为导则的医疗设施改善项目 该项

was created to assess, redefine, and redevelop Louisiana's network of then-132 free-standing program sites across Louisiana's sixty-four parishes (counties).¹⁷ This network consisted of nine regional offices, seven regional laboratories, seventeen specialty clinics, i.e. STD/TB clinics, and nine Children's Special Health Services (CSHS) clinics, and seventy-four parish health centers.¹⁸ This SFI program now stands as the longest running health agency-sponsored EBR&D effort of its kind anywhere in North America.¹⁹ Prior to 1990, Louisiana's network of public health facilities was highly uneven in quality. Each parish operated autonomously when it came to its clinic facility, without scant coordination or knowledge sharing between jurisdictions. However, every parish is mandated by the 1974 Louisiana State Constitution to pay for, build, and operate its own Parish Health Unit, and DHH-OPH is mandated to staff and operate every program site throughout the State. Suffice to say, the situation across parishes was anything but equitable in terms of the architecture of this network. New facilities sometimes did not meet Americans With Disabilities Act (ADA) minimum standards for handicap access; some even lacked sinks in exam rooms, and little concern was paid to patient privacy or confidentiality needs. As of November 1990, 66% of all DHH-OPH facilities had been housed in the same quarters for thirty years or longer. Nearly all of the program sites suffered from a chronic case of deferred maintenance. The system was broken.

The SFI process, beginning in the fall of 1991, first yielded an evidence-based compendium of 140 facility site planning and architectural design guidelines. These, each one page in length, augmented with graphic diagrams, were based on twenty-five on-site post occupancy evaluations. These twenty-five POEs consisted of photos, interviews, focus groups, and detailed walk-throughs. In addition, an 11-page statewide facility survey was administered statewide in 1991, 2003 and again in 2012.²⁰ The survey's contents centered on external conditions such as on-site parking, nearby public transport, site lighting and the general aesthetic appearance of the exterior of the clinics. Interior issues studied covered the main waiting room and subwaiting room, sign-in station, patient intake/admissions, medical records storage and retrieval spaces, offices, storage spaces, examination rooms, laboratories, nutritional education rooms, workspaces for physicians and nurses, and staff break rooms. Lighting levels, privacy amenities for patients, and the overall appearance and condition of the interior of the facility were also examined. The facility survey was completed by staff persons in every clinic and support facility in the statewide DHH-OPH network. The survey results were analyzed statistically and the results were translated into the 140 planning and design guidelines. These findings then became the basis of the design of all future renovated facilities and replacement facilities. Concepts (as translated from the survey evidence provided by the building users) included the importance of easy-to-navigate paths and corridors, effective directional signage, courtyards as spatial orientation devices, occupants' preference for nature and natural materials such as wood, natural daylight where feasible, meaningful views to the outside, sustainable design amenities such as solar and geothermal systems, and patient privacy.

Public Health Capital Improvements: 1990-2012

The SFI program's continuous operation since 1991 has been a testament to it being a win for the local community as well as a win for the statewide agency. Its longevity and continued financing has hinged on these five factors: strong grassroots local support, a demonstrated track record of beautiful new replacement facilities, a belief in the power of evidence-based healthcare research and design, perseverance on the part of the SFI team, and a statewide health agency with courage and vision.²¹ A total of sixty-five capital improvement projects have been successfully completed as of the

目全名为“战略设施提升计划”(Strategic Facility Improvement Initiative, 简称SFI)。旨在评估和改善路易斯安那州的医疗网络,包括当时64个县郡的132处独立运营的医疗设施。¹⁷这一医疗网络9个地方办公室,7个地区实验室,17个专科门诊(如性病门诊、肺结核门诊等)以及9个儿童专项医疗服务机构和74个县级医疗中心。¹⁸SFI项目是迄今为止北美范围内运作时间最长,由政府医疗卫生机构提供资金的循证设计研究项目。¹⁹

1990年以前,路易斯安那州的医疗机构在质量上分布很不均衡。每个县郡自主运营门诊机构,在医疗网络内部缺乏信息共享和组织协调。根据1974年的路易斯安那州州宪法,每个县都必须出资建立并运营自己的县级医疗部门。同时DHH-OPH被要求提供医护人员并运营州内的所有设施。各个县之间的医疗设施建筑品质参差不齐,有些新的医疗设施甚至不能满足《美国残疾人法案》(ADA)里要求的无障碍通道的最低标准,有些在诊室中甚至没有洗手池,而病人隐私和保密的问题依旧没有被考虑到。1990年11月,DHH-OPH管辖下的医疗设施中,66%的诊所已经持续使用30年以上。几乎所有医疗设施都维护不善,医疗设施网络已经支离破碎。

SFI项目开始于1991年初,140处医疗设施场地的循证规划与设计原则的编写标志着项目的正式开展。每处设施有一页纸辅以图表的说明,完全基于25例现场进行的使用状况评估。25例POE工作包括拍照、采访、目标组(focus groups)调查和现场调研组成。除此之外,1991年、2003年和2012年分别有3次11页长的关于医疗设施的问卷调查在全州进行,²⁰内容包括医疗设施的外部环境,如停车场、附近公共交通、场地照明和门诊外观审美等评价。医疗设施的内部环境同样囊括其中,包括候诊大厅、候诊室、挂号处、住院处、病案室、办公室、储藏室、诊室、化验室、营养康复室、医护人员工作室和休息室等。照明水平、私密设施以及内部的整体表现和条件也在调查范围之内。调查问卷的对象是医院里工作的医护人员和DHH-OPH医疗网络内的医务工作者。通过统计分析,调查结果被应用在了前文提到过的140项设计导则当中,成为未来医疗机构设计更新所依据的基本准则。从调查结果中得出了一些比较重要的概念,比如导向明确的流线设计,有效的标识系统,有引导作用的庭院,使用者对自然以及自然材料的偏好(例如木材),尽可能的自然采光,良好的视野,可持续设计的设施如太阳能和地热系统,病人的隐私保护。

公共卫生设施改建: 1990~2012年

SFI项目从1991年持续至今,已经开创了地方社区与全州医疗机构的双赢局面。这个项目得以长期延续而且有资金支持,缘于以下5个因素——强有力的民间支持,对更新后的高质量医疗设施的完善记录,以循证规划设计为导则,SFI项目组成员坚持不懈的努力以及全州医疗机构的勇气和远见。²¹共计65处重要的改善项目于2012年底顺利完成,其中41处为新建设施,15处为已有设施翻新及/或扩建,9处为转换为医疗功能的设

end of 2012. Of these, forty-one completely new replacement facilities were constructed, fifteen facilities were renovated and/or expanded, and nine existing buildings were adapted to healthcare uses. The average project planning phase, inception, to groundbreaking, was 12.8 months; average length of time from groundbreaking to opening day was 10.9 months. With respect to the distribution of construction activity, the average size of a new facility was 9,949 total building gross square feet (BGSF). This represented 407,909 total BGSF in new construction. Renovations and adaptive uses of existing buildings averaged 4,972 BGSF per project, totaling 119,328 BGSF. The average project cost \$1,020,512 (unadjusted for inflation). Capital improvement expenditures across the nine administrative regions totaled \$66.3 million. This construction activity has been counter-balanced to some extent by thirty (30) facility closures. The services housed in these clinics were consolidated into nearby existing facilities.

As mentioned, the SFI is the longest running EBR&D healthcare program of its kind. In Louisiana, most of the program sites in need of capital improvement are now done, although considerable work remains.²² A number of replacement facility projects remain in the planning stage at this writing.²³ The SFI also responds to any clinic that has been damaged in recent Hurricanes. The 2012 statewide facility survey results once again reflected continued support of staff personnel for the SFI program. Staff often reported that a halo effect occurs whenever a new or renovated facility opens. The number of average monthly patient visits can rise as much as 20% as opposed to when the clinic was housed in its old quarters. Longtime patients often comment on the new clinic's more inviting atmosphere and its uplifting aesthetics.

Two Case Studies

1. Clinic Center in Rayville

For thirty years, the health unit in Rayville, Louisiana was housed in the center of a town of 12,000 residents in a prefab metal structure it shared with a branch of the State Office of Social Services. In recent years the occupants had been forced to endure the stench of a broken sewer line running directly beneath the clinic. This, compounded by the windowless conditions, was too much for occupants, especially during the long hot, humid summer months. A section of a map that was drawn in the late 18th century, Norman's Chart of the Lower Mississippi River, by the French cartographer Adrian Persac, illustrated every slave plantation parcel between New Orleans and Baton Rouge, on both sides of the Mississippi River. Each plantation was identified by its landowner and by the family name. Today's pattern of asymmetrical plat boundaries endures as much as a fascinating tapestry of bisecting, interdependent geometries, as a testament to the bygone era of the antebellum Old American South (Figure 1).

The proposed replacement clinic for Rayville, designed by the author, houses an environmental health program, a clinical realm comprising six trans-programmatic exam rooms, and a clerical and administrative realm with a set of five combined intake-staff offices. Square footage totals 10,150, and the building is elevated four feet above the Mississippi River delta flood plain. The building's "legs" provide structural support in this regard, and HVAC systems are supplied from beneath the main floor via an 18-inch depth interstitial two-way truss system (Figures 2-6). The parti' features these planning and architectural concepts:

Decentralization – the main vehicular and pedestrian access point to the building occurs near its midsection. This allows for direct access to either an autonomous environmental health module, to one side or the clinic on the other side of this arrival/patient drop-off drive.

Flexible Configuration – the parti' is transformable, able to take on any number of alternative shapes, from linear to curvilinear, re-configurable on sites elsewhere of varying

施。项目从规划、立项 (inception) 到动工, 平均耗时 12.8 个月, 工程从破土动工到交付使用平均耗时 10.9 个月。新建项目的平均建筑面积为 9 949 平方英尺 (约 924 m²)。总计 407 909 平方英尺 (约 37 895 m²) ; 翻新项目的平均建筑面积为 4 972 平方英尺 (约 462 m²)。总计 119 328 平方英尺 (约 11 086 m²)。设施改善平均每项项目耗资 1 020 512 美元 (不计通胀率)。9 个行政区域的设施改善耗资总额约 6 633 万美元。在建设的同时, 有 30 个医疗设施被关闭, 其中提供的医疗服务被就近整合。

如上文提到的 SFI 是持续时间最长的循证设计项目。路易斯安那州该项目中大多数需要改善的工程已经完成, 尽管还有大的工作仍在进行。^[22] 本文成文之际, 一些医疗设施更新的项目处在前期规划阶段。^[23] 被近期飓风破坏的医疗设施修缮和重建工作也被列入 SFI 项目之中。2012 年全州设施问卷调查结果再次反映了医护人员对 SFI 计划的持续支持。他们经常反映, 每一处新设施落成或旧设施翻新都会产生一定的连锁效应——新的医疗设施里的月均就诊人次比之前可能增加 20% 之多。长期就诊的患者对新的医疗设施普遍有积极的评价, 认为就医环境更加亲切、美观。

案例研究

1 雷维尔镇医疗中心

路易斯安那州雷维尔镇拥有 1.2 万居民, 但位于镇中心的医疗部门三十年来一直与州立社会服务办公室共用一个预制的金属建构建筑。近年来, 医护人员不得不忍受一条破损的污水管线在医疗中心下穿过污水管线, 以及没有窗户的建筑, 使医疗中心中的使用者们饱受煎熬。尤其在漫长而潮湿的夏季, 法国绘图员安德利翁·帕萨克 (Adrian Persac) 于 18 世纪晚期绘制的场地剖面图——诺曼的密西西比河下游图——展示了密西西比河两岸新奥尔良与巴吞鲁日 (Baton Rouge) (路易斯安那州首府) 河段的所有奴隶种植园。每一处种植园都被标识出来并以园主家族名称命名。该场地如今呈非对称式的平面布局, 地形特征以河流为轴向两侧均衡分布, 呈现出如挂毯一样迷人的图案。这种咬合交织的几何形状成为已经远去美国南北战争之前的“旧南方”的见证 (图 1)。

雷维尔镇医疗中心重建项目 (笔者为该项目的设计师) 包括一个环境卫生机构, 由 6 间综合诊疗室组成的门诊区, 由 5 间办公/问诊室组成的办公和管理区, 建筑面积共 10 150 平方英尺 (约 943 m²)。建筑的底部架空至密西西比河洪水线之上 4 英尺 (约 1.22 m) 的高度, 以支架提供结构支持。暖通系统被安置于建筑底层之下梁高 18 英寸 (约 0.46 m) 的双向桁架结构体系之中 (图 2~图 6)。其规划和建筑设计概念具有以下特点

分散性——通往建筑的主要车行和人行通道位于建筑中央, 从而使人们从这个落客区直接进入一侧独

proportions. Its pre-manufactured pods can be deployed in a horizontal accordion-like or variable expansion depending on user needs.

Parking/Site Access – the separation of the environmental health program "building" apart from the clinic "building" allows for options regarding the placement of parking areas, access drives, and pedestrian walkways leading to and from the facility.

Minimum on the Site Impact – the thin, linear footprint of the facility allows for the retention of the maximum amount of existing natural vegetation on its environmentally sensitive site. The building possesses 'lightness' in this regard as it appears to float above the ground plane. Its linearity also affords the direct transmission of natural daylight into interior spaces.

Modularization – ten modular pods are structurally autonomous from one another and yet interconnected and stabilized by steel tubular conduits. The legs of these pods are telescopic. These devices allow for variability in deployment, not unlike the elevated jet ways passengers use to embark and disembark airliners in an airport.

Sustainable Environmental Systems – the building parti' minimizes the reliance on costly mechanical HVAC systems through the use of passive solar design techniques, including sunscreens, roof overhangs, and a geothermal system. The building maximizes sustainable 'green' building materials, furnishings, and fixtures throughout.

Decentralized Seating – the building is intensely human-scaled. Six window seat

立的环境卫生机构，或者进入另一侧的门诊。

建筑形态的灵活性——各建筑单元易于重组和变形，功能上也容易转换，能够适合不同形式的布局。直线和曲线均可，而且在其他场地上也能以多种比例重组。由于是预制件装配而成的建筑单元，因而在水平面上建筑群可以根据病人数量和功能需求呈手风琴状扩展。

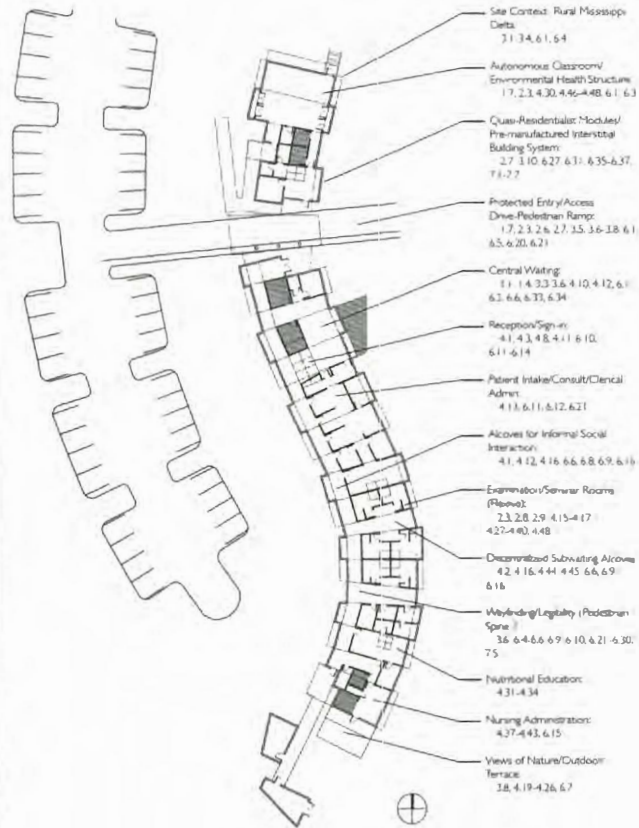
停车/基地可达性——考虑到到达和离开的人们的停车位置、车行通道和步行路径等不同选择，环境卫生机构与门诊建筑分设。

最小化对基地影响——由于底层架空，建筑呈现出一种“轻盈感”，仿佛漂浮于地面之上，医疗中心狭窄的线性占地最大限度地保留了场地生态敏感区原有的自然植被，线性平面设计使建筑内部能够最大程度获得自然通风和采光。

模块化——10个结构独立的模块单元之间由钢管连接以加强稳定性，支撑结构的柱子可以伸缩，使结构能够适应不同的场地，就像机场里连接飞机和航站楼的机场廊桥一样。

可持续的环境系统——设计采用了可持续的节能系统，通过太阳能技术、遮光板、屋檐出挑设计和地热系统，很大程度上降低了对高能耗的暖通系统的依赖，同时使用环保建筑材料和环保工艺，最高效利用绿色能源，实现环境系统的可持续性。

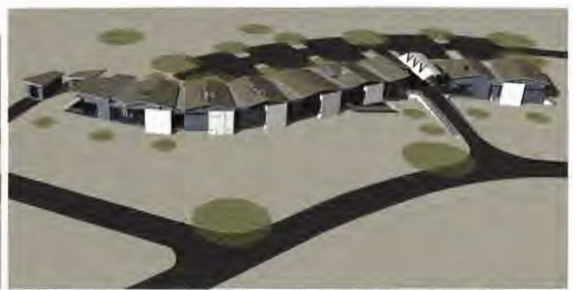
座椅和等候区分散布置——建筑设计尺度人性化，6个



1. 18世纪密西西比河下游图，展示了沿河奴隶种植园的范围（左图），雷维尔镇医疗中心重建项目一层平面（右图）
Figure 1: Eighteenth-century map of lower Mississippi river, depicting slave plantation boundaries(left); Annotated floor plan of Rayville, Louisiana Clinic (proposal)(Right)



2. 雷维尔镇医疗中心西向鸟瞰
Figure 2: Rayville outpatient clinic, view to west



3. 雷维尔镇医疗中心东南鸟瞰
Figure 3: Rayville outpatient clinic, view to southeast



4. 雷维尔镇医疗中心挂号处和中心候诊大厅
Figure 4: Rayville outpatient clinic, check-in/
main waiting area



5. 雷维尔镇医疗中心沿门诊内主要人行通道的临窗候诊区
Figure 5: Rayville outpatient clinic
window-seating along corridor



6. 雷维尔镇医疗中心望向室外的视野
Figure 6: Rayville outpatient clinic, view
to exterior

bays are placed along the clinic's undulating pedestrian spine that allow views to the surrounding landscape. This precludes having to sit in an institutional 'waiting room.' As for personal space, five or six can sit comfortably here, or perhaps just a nurse and his/her patient, engaged in private consultation.

Flexible Room Spaces – the intake/admit offices and exam rooms provide flexible space for transactions between the patient and the staff person, from private consultation to diagnostic/treatment use to small group meetings. The examination rooms can be converted in size via mechanically activated panels. Exam rooms are spacious, allowing nurse and physician to also use it for his or her administrative work.

Communal Spaces – the nutritional education kitchen doubles as subwaiting room and a staff conference room. A multipurpose community health education room is housed in the environmental health wing across the arrival/patient drop-off drive. These spaces feature natural daylight and views to the surrounding landscape.

2. New Campus of Clinic Center in New Iberia

Numerous replacement facilities have opened recently, including the new campus in New Iberia, Louisiana (2012). It was designed by the Architects Design Studio (Figure 7) in consultation with SFI project team (including this author). As with other replacement facilities, EBR&D directly helped shape the architecture. The main clinic, its porte' cohere' and an adjoining environmental health building are connected by a covered walkway (7a). The interior of the facility is attractive and presents a positive, dignified image to its users, with a large main waiting room that adjoins a sign-in station, five spacious intake/clerical offices, and a Vital Records Office for birth certificates and death certificates. Large full height glass doors allow the staff to maintain direct visual contact with the main waiting room without compromising patient confidentiality during intake interviews (7b). The clinic laboratory is linked to an adjoining restroom for use by patients for them to provide

靠窗的座椅区沿着门诊内主要人行通道布置，使等候的病人能够看到窗外美丽的自然风景，避免了病人在传统的候诊室中候诊时的枯燥乏味。同时，每个座椅区仅为5-6人使用，不仅候诊空间相对个人化，而且病人与医护人员也可以在这里进行单独咨询。

空间使用弹性——问诊室和检查室能够为病人和医护人员提供各种活动提供灵活的空间，既适合私密性强的活动如病情咨询和问诊，也适合公共交往如小型会议。检查室可以用活动墙调整出不同尺度的空间；诊室的空间较大，护士和医生也可以用来办公。

多用途的公共空间——营养教育厨房可以兼作次要候诊室和工作人员会议室。穿过中央的落客区，环境卫生机构的建筑可兼作多功能活动室，用来进行社区健康教育。这些空间均有良好的自然采光和面向自然景观的良好视野。

2. 新伊比利亚的门诊医院新址

许多更新过的医疗设施都在近期开诊，其中包括2012年使用的路易斯安那州新伊比利亚市门诊医院新址。该医院是由Architects Design Studio设计，SFI团队提供咨询的项目。笔者担任项目顾问。跟其他项目相似的是，这一设计也是在循证规划与设计指导下进行的。主要的门诊楼的门廊（porte' cohere'）与毗连的环境卫生楼由一个有顶篷的步行廊道连接（图7a）。门诊室内设计宜人，给使用者以积极的心理感受。医院内部有一个中心候诊大厅，挂号柜台连接着5个文员办公室和出生、死亡证明档案室。玻璃门为医护人员和候诊大厅的病人提供了良好的视线联系。同时在问诊时保障病人的隐私（图7b）。化验室紧邻卫生间，配有1英尺（0.3 m）见方的不锈钢小窗口，方便病人将采集的样本递



7. 路易斯安那州新伊比利市的门诊医院建成环境
Figure 7: New Iberia, Louisiana outpatient clinic campus, 2012

pass through specimens through a 1' x 1' stainless steel portal (7c). The intake/clerical offices are spacious (7d). The examination rooms are equipped with a gowning alcove, a flex exam table, sink, charting desk, and supply cabinets. This zone double functions as a nurse/physician workstation (7e). The environmental health program section in the adjoining building features a main waiting area, open plan work area, the laboratory for field specimen storage, and offices for Parish Sanitarians who inspect food establishments, water quality, and who review all sewerage permits for new construction in the local community (7f). The nutritional education demonstration kitchen is configured to simulate the scale and function of a residential kitchen (7g), and an electronic, modular, Spacesaver system houses the medical charts that are non-digital (7h).

Summary

In EBR&D, the daily inhabitants are viewed as possessing knowledge and insights of importance. The sponsoring client, medical planner, interior designer, landscape architect, medical equipment and furnishings specialist, and the Project Architect can all benefit.²⁴ Too often, unfortunately, the role of the day-to-day occupant is overlooked, or dismissed entirely as a resource. But this is not the way it has worked in the SFI program. The experience and preferences of the direct occupants – staff and patients – have functioned as the bedrock foundation of the SFI and its metrics in Louisiana. The core philosophy of the SFI program is the belief in the importance of early intervention with the building's users – with this step being essential to the overall success of any construction project.²⁵ Choosing the most suitable location to build a replacement facility has proven in many cases to be painstaking, requiring weeks, months (even years) of deliberations, and at times, political setbacks. All this, even before the architect is hired. Is the best strategy renovation, new con-

送至化验室 (图7c)。文员办公室和问诊室宽敞明亮 (图7d)。检查室内部配有壁柜、一个可动的检查床、洗涤槽、记录桌以及盛放医疗器械的橱柜。这一区域可以兼作护士和医师的操作空间 (图7e)。与门诊楼毗连的环境卫生楼设有一个主要的等候区、开放式的工作区。存放现场样本的实验室和当地检测食品和水质以及发放新工程项目排污许可的公共卫生专员的办公室 (图7f)。以营养教育为目的的展示性厨房配备有模拟住宅中的厨房尺度和功能的厨房 (图7g) 以及一个电控的、组装式的、节约空间的系统。用于存放非电子病历 (图7h)。

总结

在循证规划设计中，医疗设施的日常使用者被视为最有发言权的人群。提供资金支持的业主、医疗规划师、室内设计师、景观规划师、医疗器械维护人员、装修人员以及项目建筑师都能从中受益。^[24]在以往的设计方法中，设施的日常使用者往往容易被忽视或者被完全排除在设计之外。而这正是SFI项目组反对的设计方式。医疗设施的直接使用者，例如医护人员和病人的感受和偏好是路易斯安那州SFI项目组工作开展的基础。SFI项目的工作理念坚信在设计之初与使用者的良好沟通是整个工程成功的决定性因素。^[25]医疗设施改建的选址往往最费周折，常常需要数周、数月甚至数年来推敲，有时还会受政策的制约。所有这些都是在建建筑师被雇佣前要做的工作。对于一个项目最理想的策略，到底应该翻新还是新建，抑或是两者结合？项目的工程范围、建造和装修预算以及场址必须率先落实。^[26]关于这一问题的深入探讨可以参考范德勃 (Stephen Verderber) 和坎布雷尔 (Joseph Kimbrell) 2005年的文章，其中包括SFI项目的实施纲要，在社区层面的具体执行过程以及对医疗政策的启示等内容。^[27]

在美国乡村地区，一处新的医疗设施是整个社区基础设施

struction, or a combination of both? The project scope, construction and furnishings budget, and the construction site must be established.²⁶ The reader is referred to Verderber and Kimbrell (2005) for a broader discussion of the SFI protocols, its operationalization at the local community level, and its broader health policy implications.²⁷ In rural towns and villages across the U.S., a new healthcare facility is an important addition to the community. A beautiful new freestanding outpatient clinic can rival a new public library – as symbols of civic pride and accomplishment.²⁸ A new clinic in one town will often spark a competitive spirit, with a neighboring town soon electing to follow suit. This is a positive trend and is to be encouraged. Louisiana is a state that persistently ranks at or near the bottom in national health statistics. It has one of the highest poverty rates, lowest median income levels, and highest percentages of uninsured.²⁹ Approximately 947,000 residents lived below the poverty line in 2011, the state's poverty rate was 21.1% (second highest in the nation), and the median family income was \$40,658 (ranking 46 out of 50 states). Worse, 20.8% of its residents, or 938,000 persons, did not have private health insurance of any sort. Only Texas and Nevada had higher rates of uninsured citizens.³⁰ In Louisiana, stubborn rivalries still linger between urban, suburban, and rural communities over the equitable distribution of very limited taxpayer dollars.³¹ The SFI and its use of EBR&D transcend political rivalries and turf wars while concurrently embracing local vernacular architecture traditions.³² As for the Architect, his or her legal responsibility is to serve the best interests of the public's "health, safety, and welfare."³³ Unfortunately, the promise of EBR&D in the service of the medically underserved remains largely unfulfilled. Many architects in the United States, and globally, are about to be called upon to rethink their position in this regard.³⁴ Architectural advancement requires a disciplined commitment to move beyond the status quo.³⁵ More than 31 million more Americans soon will have healthcare insurance coverage as provided through the Affordable Care Act of 2010. For the first time in many decades, a new source of funds will be available for building new and replacement freestanding outpatient care clinics in medically underserved neighborhoods, towns, and cities. This has not occurred since the demise of the federally funded Hill-Burton capital construction program for national hospital and clinic construction. This program ran from 1946 to 1971. Patient advocacy – for persons with health disparities – has been at the heart of this twenty-one year program. Sadly, many medically underserved, along with their caregivers, continue to coexist in overcrowded, dysfunctional settings.³⁶ All this, while government sector health care providers are being called upon to do more yet with fewer fiscal resources due to budget cutbacks.³⁷ One highly promising means to increase patient access to care, especially in rural locales, is to bring mobile health clinics into the healthcare delivery system in places where patient access to care remains limited. The absence of a fixed site, permanent clinic will not suffice. These clinics-on-wheels are redeployable, versus always opting to construct a stationary "permanent" building. Furthermore, a mobile clinic is far less costly to build, operate, is less taxing on the environment, and can help alleviate chronic funding shortfalls on the part of the care provider organization.³⁸ The alternative is unacceptable – coping with an overcrowded forty to fifty year-old fixed-site clinic plagued with a leaky roof and a gravel parking lot, with little hope of meeting federal Health Information Privacy and Protection Act (HIPPA) or federal Americans With Disabilities Act (ADA) minimum facility design and construction standards.³⁹ Innovative fixed-site and transportable architectural solutions are needed.⁴⁰ There has perhaps never been a more opportune moment in the U.S. to innovate – reinvent – freestanding outpatient clinic building types for the medically underserved.

的重要补充：一处高品质的独立社区门诊可以匹敌一座公共图书馆，成为当地的地标建筑，甚至是市民的骄傲。^[28] 某一小镇中新建的门诊常常会引发“竞争效应”——其相邻的小镇会争相效仿建设新的医疗设施。这是一种积极的行为，并且值得提倡。路易斯安那州在全美各州的公民健康状况排名中持续倒数，是全美贫困率最高、平均收入最低和未参保人数比例最高的州之一。^[29] 2011年的统计显示，大约947 000名居民生活在贫困线以下。该州有着21.1%这一全美第二高的贫困率，而且中产阶级家庭年收入仅为40 658美元，在美国50个州中排名第46。更糟糕的是，路易斯安那州20.8%的居民，即938 000人没有参与任何类型的私人健康保险。在全美国只有德克萨斯州和内华达州有着比路易斯安那州更高的未参保率。^[30]

在路易斯安那州，城市、郊区和乡村地区之间在如何平等分配有限的税收上仍旧存在着顽固的矛盾。^[31] SFI项目与其采用的循证规划设计导则超越了政治上的对立和地盘争斗，并且积极融入了具地方特色的建筑传统。^[32] 建筑师在这个项目中肩负的责任是秉持“健康、安全和福利”的设计理念最大限度地服务于公民。^[33] 然而遗憾的是，EBR&D在医疗服务欠缺区域的作用远未充分发挥。美国及全球的建筑师都应对此进行反思。^[34] 建筑学的进步需要业界对改变现状这一需求形成共识，并开展多学科合作。^[35] 超过3 100万的美国公民将受益于奥巴马医改从而获得医疗保险。数十年以来将第一次有一笔财政开支用于医疗水平欠发达地区的社区门诊医疗设施的更新与建设。这是继1946~1971年的联邦政府《希尔-伯顿法》(Hill-Burton Act) (见译者注³) 之后的第二次全国范围内实施的医疗设施建设计划。

“以病人为中心”的理念曾是这一长达21年的SFI项目的核心思想，遗憾的是，在很多医疗水平欠发达地区，病人和医护人员只能使用现有的拥挤并且功能混乱的医疗设施。^[36] 此外，在政府财政吃紧而资金减少的同时，隶属公共医疗机构的医护人员却需要付出更多。^[37] 基于此，一个很有潜力的增加病人就医机会的方法是在现有的医疗体系中增加“流动诊所”，尤其是针对比如乡村等当地居民仍然难以获得医疗服务的地区。相对于建造一个静止而“永久”的建筑，这些“车轮上的诊所”是可移动的，且功能灵活、使用方便。更进一步来说，流动门诊在建造和运营成本上都更低，对环境造成的负面影响也更小，并且可以缓解医疗机构长期的资金短缺。^[38] 我们已经无法接受一个已经使用了45年、屋顶破损、停车场碎石遍布、拥挤的老旧诊所。这种建筑品质很难满足美国联邦《健康信息隐私保护法》(Health Insurance Portability and Accountability Act, HIPPA) 或《美国残疾人法案》(Americans with Disabilities Act, ADA) 中所规定的基础设施最低标准。^[39] 我们现在需要有创造力的固定和可动的建筑方案。^[40] 对于美国来说，要发展可移动的医疗设施，现在是最好的时机。■

注释

1 1965年 美国国会通过了《老年医疗照顾计划》(Medicare, 简称医疗照顾)和《穷人医疗援助计划》(Medicaid, 简称医疗援助)两大公共医疗保障计划 医疗照顾和医疗援助的基本目标是向老年人、残疾人 和穷人提供平等的就医机会。

参见 Schneider P. ECA Knowledge Brief: Mitigating the Impact of the Economic crisis on Public Sector Health Spending[OL]. The World Bank Europe and Central Asia Knowledge Brief, 2009 [2012-09-15]. <http://www.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT.htm>.

2 循证设计 (Evidence-Based Design) 的概念是从循证医学 (Evidence-Based Medicine) 的概念中推演出来的 在美国循证规划与设计领域被广泛采纳的定义是由美国学者柯克·汉密尔顿 (Kirk Hamilton) 提出的 循证设计是谨慎、明确和明智利用现有最完善的研究证据来指导设计实践和设计决策。

参见 Hamilton DK. The four levels of evidence-based practice [J]. *Healthcare Design*, 2003,3(4): 18-27.

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这一针对项目独特性的设计过程尤其适用于医疗设施规划与设计。研究证据来自于严谨的学术研究以及工程项目的使用状况评估。

3 《希尔-伯顿法》(Hill-Burton Act) 官方全称《全国医院调查和建设法》(National Hospital Survey and Construction Act), 授权联邦政府资助床位短缺地区 主要是乡村地区的医院建设。美国医院的数 在《希尔-伯顿法》的刺激下迅猛增长。

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作者简介

斯蒂芬·魏德勃: 建筑学博士 博士生导师,
美国国家注册建筑师委员会理事
美国克莱姆森大学建筑学院医疗建筑专业教授
公共卫生学院兼职教授
R-2ARCH建筑事务所首席设计

译者简介

姜 珊 风景园林学硕士 美国克莱姆森大学建筑学院 博士研究生 (医疗建筑环境研究)

校对者简介

肖雁文 建筑学硕士 美国克莱姆森大学建筑学院医疗建筑系 硕士生
江 宇 建筑学硕士 美国克莱姆森大学建筑学院医疗建筑系 硕士生

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