

ANNETTE K. VANCE DOREY

THE MILK CONNECTION: PORTLAND'S INFANT MILK
STATION AND PUBLIC HEALTH EDUCATION

Progressive Era reformers worked to improve the health standards and living conditions of poor and immigrant populations in United States cities. In this article, Annette K. Vance Dorey highlights the often overlooked work of the nurses who managed "milk stations" – early public health clinics established for distributing clean milk in urban neighborhoods. Dorey argues that these nurses, who also conducted parent education classes and provided access to a range of health services, played an important role in the reduction of urban infant mortality rates and the development of the public health profession. Dorey is an educator specializing in teacher and parent education who lives in Brunswick, Maine. She has recently published BETTER BABY CONTESTS: THE SCIENTIFIC QUEST FOR PERFECT CHILDHOOD HEALTH IN THE TWENTIETH CENTURY (McFarland).

"Where the milk nurse is expected to visit her babies in the homes her work is very interesting and also very instructive to herself as well as to those she visits. No one knows the life of the working classes...without going into their homes in a sympathetic manner in the hope of being able to help them cope with some of their many problems, and probably the nurse engaged in social work, whether the milk nurse or some other, sees the conditions more clearly and realizes their significance more fully than almost any one else."¹ (*Boston milk station nurse supervisor, 1911*)



This cartoon, published in the *Portland Evening Express and Advertiser*, March 9, 1916 takes a humorous look at the Portland Milk Station's involvement in "National Baby Week." The woman wearing glasses with her arms folded across her chest, standing behind and to the right of the astonished baby, is meant to be Nurse Lillian O'Donahue of the Portland Milk Station.

Lillian R. O'Donahue, R.N., Portland's only "milk nurse," filled an important role in the public health movement in Maine late in the Progressive Era. As a milk station nurse, she was in a unique position to enter the world of working-class residences on congested and culturally diverse Munjoy Hill. From 1911-18 she improved general health habits and intervened to reduce Portland's high infant mortality rates. O'Donahue witnessed poor, crowded living conditions on a daily basis and communicated those conditions to the Portland City Club's Public Safety Committee, sponsor of the Portland milk station in which she worked. O'Donahue helped shape public health reforms by adapting the movement's broader ideals to a specific population

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in the neighborhood where she grew up and still resided. As the American daughter of an Irish immigrant, O'Donahue understood the old-world customs and language of one of the ethnic groups she instructed in home visits. Immigrant mothers, who often have been portrayed as resistant to middle-class intervention, appreciated the efforts of individual nurses like O'Donahue more than the program as a whole. A closer look at the milk station in Portland, Maine, and its only "milk nurse" reveals the crucial role played by these nurses in the implementation of Progressive Era public health reforms.

Milk stations (or milk depots) began as sanitary centers run by municipal and private agencies to distribute cheap or free "certified" (clean) milk in urban centers in the 1890s. They were supported by a combination of private contributions and municipal revenue: municipal milk commissions, charities, welfare and visiting nurse associations. Over time they evolved into infant milk stations and clinics, becoming important components of America's rapidly expanding public health movement. The United States Public Health Service reported that 43 milk stations operated in 30 cities with populations over 50,000 in 1910.²

Massachusetts led the nation with a law in 1856 to regulate Boston's milk supply by preventing adulteration of milk with water. In 1861, A Boston milk inspector was appointed and laws were enacted against "loose milk" and the "dip can." Pure milk distribution began in 1900 with the establishment of the Boston Milk Fund charity. By 1910, infant milk depots served New England in Boston, Lawrence, Lowell, New Bedford, Worcester (MA), Hartford, New Haven, Waterbury (CT), and Providence (RI). Boston alone had 12 milk stations by 1914.³ The Portland milk station opened in 1911 and it served children and mothers for nearly a decade.

Milk stations acted as more than just standardized centers that dispensed milk, held wweekly assembly-line weigh-ins, and conducted cursory examinations of neighborhood babies by physicians. Nurses' home visits, including instruction and demonstrations on infant feeding, sanitation, and general hygiene



Concerns expressed about the quality of milk available to urban dwellers are depicted in this educational poster published by the Chicago Health Department in 1911. Similar concerns in New England led to the establishment of "milk stations" in the first decades of the twentieth century.

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followed weekly examinations. Mothers congregated every week or two at milk stations, often accompanied by their older daughters, for baby care classes instructed by the doctor and/or nurse. This work helped Americanize families who often struggled with learning the English language and adapting to unfamiliar urban conditions.

Why were milk stations established? The Progressive Era's new socially oriented and increasingly organized health professionals mobilized the nation to reduce extraordinarily high infant mortality rates. Particularly vulnerable were children living in crowded urban areas whose working-class households and corner grocers lacked adequate refrigeration. Public Health reformers located infant milk stations where living conditions and unregulated milk handling and marketing were identified as primary contributors to gastrointestinal diseases that resulted in high death rates for the young.⁴ Programs aimed at improving infant survival were usually stepped up in cities during hot summers when death rates soared along with general unsanitary conditions. (Table 1). The medical profession, social workers, and government studies all called for improvements in milk handling and distribution. Milk stations were a significant part of the response.

Table 1. Urban Infant Mortality Rates ⁵
(Infant deaths under age one, per 1,000 births)

	Boston	New York City	U.S.A.
1890	178	--	160
1900-1909	138	181	148
1910	165	146	124
1912	116	105	--
1913	107	102	--
1914	103	95	--
1916	--	--	101

By 1910, the milk station focus shifted from dispensing milk to instructing mothers on infant feeding and hygiene in order to effect significant mortality reductions.

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[T]he solution of the problem of infant mortality is 20 per cent pure milk and 80 per cent training of the mothers. The infants' milk stations will serve their wider usefulness when they become educational centers for prenatal instruction and the encouragement of breast feeding and teaching better hygiene.⁶

The director of New York's Bureau of Child Hygiene believed, "[W]e accomplish the most permanent results...by the use of trained nurses for practical instruction of the mothers [at] infants' milk stations."⁷ Several studies and government reports showed little improvement in mortality rates due to clean milk distribution without medical involvement and without instructing mothers in baby care and home hygiene.

THE NEIGHBORHOOD

Public health reformers conveniently situated infant milk stations in densely-populated, working-class neighborhoods where living standards were less than ideal. In Portland, the milk station opened in 1911 in two rooms rented from Portland's Charitable Dispensary on India Street in the Munjoy Hill neighborhood. The Dispensary was an out-patient clinic serving the poor and needy at no cost and was supported by donations from some of the city's wealthy men and women. The clinic's four founders were Doctors Alfred W. Haskell (1876-1957), Fred P. Webster (1878-1958), Thomas J. Burrage (1875-1952), and Phillip W. Davis (1876-1933), graduates of Maine Medical School and Harvard Medical School.⁸

Originally on the corner of Middle and India streets, the clinic had limited hours, from eleven until noon. After a few years, as its reputation developed and client numbers increased, it moved across the street to "improved quarters." As work increased, they expanded to the second floor, and added an obstetrical clinic, supervised by Davis.⁹ For nine years the Dispensary doctors provided medical attention to O'Donahue's young patrons. A new brick structure designed by John Calvin Stevens was built in 1913 and renamed "The Edward Mason

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Dispensary,” honoring Dr. Edward Mason (1816-90) and his well-known apothecary of fifty years. In addition to renting the lower level of the new building to the milk station, the Dispensary then served as an outpatient ward for Maine Medical School students from Bowdoin College. When the school closed in 1923, the Dispensary was given to the city with the stipulation that a free clinic continue under city supervision. Public dispensaries like Portland’s increased 700 percent from 1900 to 1915 and were logical links with milk stations serving the same target population.¹⁰

This working-class section of Portland lacked the distinct ethnic boundaries of larger cities, but Italian, Eastern European Jewish, Russian, and Irish origins predominated. By comparison, nearly 50 percent of Boston’s milk station patrons were Italian (25%) and Eastern European Jews (22%), closely followed by Irish (18%). City directories, census records and insurance maps reveal the demographic composition of the neighborhood served by the Portland milk station and dispensary. Buildings on Portland’s Munjoy Hill contained small first-floor businesses, with residential spaces on the second floor and above. Within a two-block radius of Portland’s milk station, for instance, various small businesses operated: tailor shops (3), barber shops (2), shoe repairs (2), cigar store, variety store, grocers (3), livery stables (2), dry goods stores (4), dispensary, drug store, coal and wood supplier, fruit shop, laundry, oil dealer, bakery, painter, stove shop, and pool hall. Some shops existed less than two years, others much longer. Dwellings built for single-family occupancy often housed multiple families with boarders and new three- and four-decker tenements were built on vacant lots in the early part of the twentieth century.

Although reconstructing and describing the Munjoy Hill neighborhood served by the Portland Milk Station is beyond the scope of this article, a close analysis of one city block helps to frame the milk station program. Take, for example, one short block on India Street containing the milk station. The 41 residents in this sample consisted of 18 men, 12 women, 11 minors (27%) and included eight married couples (53.3%). Ages

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ranged from one to 78 years (median age was 29; average age was 31). All the offspring (11 juveniles and six adults) were born in America. Of the five residential dwellings (totaling 14 separate units), only one was owned by its occupant. Table 2 shows the demographics of this one block area.

Table 2.
Neighborhood Served by Milk Station

Marital Status	Single	Married	Widow(er)
Men (n=18)	8	8	1
Women (n=12)	1	8	3
Birthplace			
Adults (n=30)		Youth (n=11)	
U.S.A.	12	U.S.A.	11
Italy	6		
Russia	4		
England	4		
Ireland	3		
Portugal	1		

Portland's Munjoy Hill by this time was more heterogeneous than many other urban settings which had clearly delineated ethnic sections. Of the 12 American-born adults, only two had parents with a foreign birthplace. Occupations were either skilled (e.g., barber, baker, painter) or unskilled (e.g., longshoreman, clerk, laborers, servant), with the exception of a teacher in the Hebrew school. There were nine (31%) unemployed adults, primarily wives.

THE MILK STATION NURSE

A segment of public health nurses, called "milk nurses," "pure milk lady," or simply visiting nurse, operated the urban milk depots and infant milk stations. These nurses were part of public health reformers' interest in promoting the new "health nurse," distinct from the "sick-nurse." Three nursing options



The "Edward Mason Dispensary," built on India Street in Portland's Munjoy Hill neighborhood in 1913 housed Portland's Charitable Dispensary, a clinic providing health care services to Portland's poor and immigrant populations. The Portland Civic Club Milk Station rented the lower floor of this building, thus bringing a range of health care and health education services under one roof. The Dispensary was designed by Portland's well-known architect, John Calvin Stevens. *(Photograph by author.)*

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were available to graduate nurses: private duty, institution or hospital, and public health nursing. Between 1900 and 1940, Portland saw a dramatic increase in nurse training schools. Maine General Hospital's training school was founded in 1885 and in 1915 it received 247 applications for nurse training of which 39 were accepted and placed on the waiting list. In 1917, Mercy Hospital began its nurse training school.

Acting on the call for improvements in maternal and child health, nurses eagerly left hospital confines, brought their work into the community, and helped define the needs of working-class families. They worked in tenement districts and settlement houses, responding to changing urban health conditions, and their publications reveal an intense ambition and dedication to healthier living. Public health nurses taught health promotion and prevention behaviors, sanitation, and disease prevention in families' homes.

The influx of nurses into the emerging public health field correlated with a major shift in the ratio of nurses and physicians to the population. In 1900 physicians outnumbered nurses ten to one per 100,000 population served whereas, by 1920, ratios were nearly identical for both. (Table 3). Physicians engaged in the new arena of public health witnessed a steady and rapid infusion of nurses into the field they had dominated. The number of graduate nurses soared from 11,800 in 1900, to 82,327 in 1910, and 149,128 in 1920.¹¹

Table 3. Ratio of Nurses to U.S. Population¹²		
	1900	1920
Nurses per 100,000 population	16	141
Physicians per 100,000 population	173	137

The emerging specialization of trained public health nurses paralleled increasing immigration and perceived social-welfare needs. Nurses responded to health-related conditions linked to urbanization and immigration. New York City's Henry Street settlement illustrates the rise of these neighborhood nurses: from 9 employed in 1893, to 27 in 1907, and 250 in 1916.¹³ The

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home visiting nurse, school nurse, and industrial nurse formed the core of what came to be known as public health nursing; the fastest growing profession to emerge in the Progressive Era.

Table 4. Nurses Working in Public Health (USA) ¹⁴

1905	1909	1912	1933	1938
455	1,413	3,000	15,865	19,390

Public health nurses learned firsthand about miserable conditions of daily life among the working poor. They worked in fast growing communities with diverse religious, racial, and ethnic make-ups. Through various social service and public health programs, they interacted with thousands of immigrant mothers and children, often teaching practical infant feeding and child hygiene techniques.

In general, reformers believed they could elevate patrons' attitudes and child care practices to resemble more closely "scientific" ideals. Most reformers focused so intently on the benevolence bestowed on less-advantaged recipients that they made little effort to hear the voices and needs of the people being served. Some reformers insisted on mothers' compliance. Milk station nurses, by contrast, consciously adapted "scientific" hygienic baby care principles to the particular conditions they encountered.

Nurses sometimes struggled to define "scientific" or "educated" motherhood for women who viewed parenting as an intuitive capability acquired within the context of tradition and heritage. Instructive nurses, such as O'Donahue, who grew up in an immigrant family, skillfully and sensitively adapted their "scientific" knowledge to the traditional practices they encountered although, ultimately, their assumptions about the life-saving value of their teachings framed their relationships with neighborhood women. They watched for signs that mothers recognized the predicted benefits of education. Milk station nurses interacted repeatedly with each mother (and extended family) in the home and this individual attention fostered opportunities for observation much more than mothers' classes

conducted by a physician. Nurses reported engaging in friendly chatter and listening for misunderstandings as they demonstrated (repeatedly if needed) hygiene techniques. While mother learned about milk modification, the nurse learned about domestic equipment needs and dietary habits. As an arm of public health nursing, the visiting milk nurse was more likely to be received in homes “not open to any other social worker” and became more a “friend and counsellor, whose recognized interest in their well-being gives weight to her suggestions.”¹⁵

The central role of one or more full-time salaried graduate nurses who operated each infant milk station has largely been ignored in social histories. Through on-going individualized instruction, nurses were able to cross class lines that separated many reformers from their clientele. These efforts were more likely to reinforce desired behavioral outcomes and were more effective than group sessions. Mothers expressed their appreciation to milk nurses who worked closely with them in developing baby-saving skills. Nurses who witnessed first-hand the detrimental living conditions under which milk station patrons lived responded by modifying infant care “rules” and hygiene methods to meet the mother’s resources, especially her kitchen equipment. Compared to milk nurses’ involvement and responsibilities, physicians served in milk stations briefly, but regularly, several hours per week. Physicians, such as those who treated the poor at Portland’s Charitable Dispensary, also instructed mothers’ classes and their presence helped legitimize the function of milk stations.

Through daily interactions with working-class mothers, nurses advanced their own ambitions and ideals. They also established an important relationship with physicians, primarily males, who were more prominent but less invested in public health services. Milk station work advanced physicians’ commitment to preventive health. Now they had opportunities to examine healthy infants and pay systematic attention to normal growth and development — unique training that complemented their more typical work with ill, delicate, and dying institutional and hospitalized children. While prescribing modified milk

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formulae, they often expressed an eagerness to learn about normal development of young children. Milk stations provided valuable “experience along prophylactic lines.”¹⁶ At times therefore, physicians acknowledged the capable tutelage of nurses who had more practical experience with children and their mothers. Regular examinations (primarily weight and measurements), combined with advice to mothers, formed the foundation of “well-baby clinics,” a logical outgrowth of milk stations, that proliferated in the early twentieth century. Several thousand physicians had preliminary experience with baby “health examinations” at infant milk stations and baby health contests.¹⁷ This adds a new dimension to the credit given to organized medicine’s “invention” of well-baby clinics, which generally ignores the role of the nurse in the acceptance and expansion of preventive health care for mothers and children.

CIVIC CLUB MILK STATION

Portland’s Civic Club, organized in 1898, sponsored Maine’s milk station and provided one-third of its operating budget. The remaining funds came from the city budget and from selling milk at cost (five cents a quart).¹⁸ Officially called the “Civic Club Milk Station,” its operating policies were influenced by prominent, middle-class club members, by the milk nurse’s experience, and by other milk stations. Portland’s milk nurse Lillian O’Donahue visited New York City at least once to observe and collaborate with other milk nurses. Twelve volunteers, probably Civic Club members, assisted Nurse O’Donahue during the summer of 1916.

Lillian O’Donahue, R.N. and her sister Eleanor boarded with their Irish father and other relatives in a rented house. Born in Maine, Lillian, a recent graduate nurse, and Eleanor, a teacher at nearby North School, were both members of the Civic Club’s Public Safety Committee. The O’Donahue women, like others of their generation, carried on the nineteenth-century pattern of choosing nursing and school teaching as career paths in order to gain independence, geographic mobility, and to establish oneself as “someone of note in her family” and in her community.¹⁹



As part of their educational outreach, many milk stations organized "Little Mothers' Clubs" to teach girls how to look after younger siblings placed in their care and to prepare the teenagers for eventual motherhood themselves. Milk station nurses also hoped that the girls would carry home the messages of proper hygiene and sanitation. Nurse Lillian O'Donahue organized a "Little Mothers' League" in Portland in 1913. (From Kathleen Wilkinson Wooten, *Health Education Procedures for the Grades and Grade Teachers*, NY: The National Tuberculosis Association, 1926.)

Lillian moved to Chicago in 1918 at age 27 and this coincided with the milk station's closing.

As an American-born daughter of Irish immigrants, O'Donahue had easier *entree* into urban immigrant neighborhoods. She understood the customs and language of certain clientele, and more easily crossed social, cultural, and class lines. The O'Donahue home was eight blocks from the milk station, and the demographic composition of their block provides an interesting comparison to that of the milk station block. Dwellings in the O'Donahue block were one and one-and-one-half stories versus the larger dwellings on India Street. Eight families, including the O'Donahues, occupied seven dwellings. The 28 residents consisted of nine men, 13 women (five married couples, 45.4%), and six minors (21%). Ages ranged from one month to 80 years. The median age was 37 and the average age was 36.6 years. All 11 offspring (five adults, six minors) were born in Maine. Of the 14 American-born (Maine) adults, 11 (79%) had

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foreign-born parents, the opposite of the India Street sample (83% American-born parents). The 28 residents represented three birthplaces: America (71%), Ireland (18%), and Norway (11%), compared to six ethnic origins in the denser sample.

The milk station block had a higher proportion of single male workers (26.6%), while O'Donahue's block was weighted on the other side with 22.7 percent single females (compare Tables 2 and 5), but the occupational profiles were similar.

Table 5. O'Donahue Neighborhood

Marital Status	Single	Married	Widow(er)
Men (n=9)	2	5	2
Women (n=13)	5	5	3

The O'Donahue women were the only two residents whose occupational status was "educated," although other service professionals may have lived on the periphery of the milk station neighborhood. Occupations spanned both skilled (baker, printer) and unskilled (factory worker, clerk). There were ten (45%) unemployed adults—all women, including all five wives and three widows—compared to the India block (31%), with its higher proportion of laborers. These small samples were not selected to represent the entire East End of Portland, but, rather, when compared with O'Donahue's work and residence sites, their demographics help illuminate the neighborhood. Similar analyses of other blocks, while time consuming, would yield a richer, more accurate depiction.

It was the milk nurses' duty to report domestic disturbances and other concerns to the municipal health department and cooperating agencies. In 1915 O'Donahue concluded home visits in cooperation with other charities in 81 cases. A Boston milk nurse revealed the delicate interpersonal nature of a job requiring stamina, tact, and determination:

Once you go into these home you become interested in the whole family and their affairs...If the husband is out of work or drinks and illtreats[sic] his wife, recourse is had to the Associated Chari-

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ties and they help out in any way that seems best...
[The nurse] frequently finds conditions which oppress the family and which they alone, because of ignorance or prejudice, cannot remove.²⁰

Visiting milk nurses believed the less formal home setting was conducive to their purpose and they threw themselves into the task of visiting as many homes as often as possible. Their first-hand observations of living conditions and daily life enabled nurses to appreciate their success in turning around high infant mortality and poor health conditions. Often they were privy to a whole new world. This responsibility reinforced the nurses' commitment to public service and affirmed their own sense of self-worth. Milk station nurses shared common bonds fostered by the nature of their occupation. They encouraged and acknowledged each others' dedication while projecting ideals onto women who shared little common ground with them, other than (sometimes) the same ethnic roots.

HEALTH AND EDUCATIONAL SERVICES

Delivery of services by the milk station also reflected the sponsors' ideology, their perception of neighborhood needs, and popular charitable philosophy. As in larger cities, Portland's milk station did more than dispense "clean milk" from a certified dairy; it also provided medical and educational services. In 1916 the Dispensary added a prenatal clinic and drew expectant mothers to the milk station downstairs. A Dispensary physician attended at the milk station three times a week to examine infants and give free advice to mothers and expectant mothers on baby care and feeding. These baby "clinics" or "consultations" combined baby examination with instruction for the observing mother. Doctors and nurses routinely weighed babies and recorded each ounce of progress. To encourage prescribed feeding practices, continued cleanliness, and weekly attendance, they showed records and charts to the mothers, or posted them for all mothers to see. At each return visit, the physician again weighed and examined the baby. The mother often would become interested in the procedure and eager to see a gain from

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week to week. In some instances, milk nurses took on the role of enforcer:

The mother brings the baby back to the clinic once a week.... If she does not return, the nurse looks her up. If she persists in not bringing the child for the doctor's help, she is dropped from the milk station records.²¹

Besides dispensing clean milk to families, milk station doctors and nurses determined feeding formulas for each infant. Physicians calculated the formula for modifying milk according to an infant's size, age, and general health. Initially, milk station staff required mothers to bring their babies in to determine the proper modified milk mixture—once a week until a few months of age and then once a month. Nurses were responsible for preparing modifications and instructing mothers and other family members in duplicating that formula. Breastfeeding was encouraged as long as babies thrived and in 1915, 56% of Portland mothers breastfed their babies.

O'Donahue dispensed milk in the morning and was available for walk-in mothers seeking advice about their children. She spent afternoons making home visits, took care of routine sanitation, repaired equipment, and held classes for the "Little Mothers' League." To promote the aim of educated motherhood, a Little Mothers' League was organized for girls (ages 9-14) who cared for younger siblings while mothers worked. Formed in the summer of 1913, 14 girls joined the Portland League. The League had three goals: (1) to reduce infant mortality among the babies cared for by older siblings, (2) to educate adolescents for potential motherhood, and (3) to encourage girls to bring their new-found child feeding, hygiene, and sanitation techniques back into their homes. Milk station nurses sought to change habits of mothers and "little mothers" in order to improve conditions and influence their clients' quality of life.

In keeping with national trends, the majority of Portland infants were ill at their initial milk station visit.²² Nurses and physicians would then usually refer sick infants to public clinics, or to private physician offices if families could afford to pay for

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services. For physicians, these opportunities to promote their own private practices by referring sick babies to their offices fostered the emerging specialty of pediatrics as well as service-for-fees.²³ Whether intentionally or not, private practices benefited from milk station referrals. The business of medicine itself flourished as pediatrics became an organized specialty. The average family repeatedly heard that they should consult a physician and more people became exposed to service-for-fee health care as charitable work declined.

The lack of uniform data reporting makes it difficult to draw conclusions about New England's milk station programs, but Table 6 compares some statistics from Portland and Boston:

Table 6. Comparison of Reported Milk Station Data²⁴		
	Portland (1915)	Boston (1914)
Population	52,000	150,000
# of Babies enrolled	260	4,097
New babies registered	137	uk
Client deaths	4	83
Operating budget	\$2,393	\$33,411
Cost of milk	\$1,458	\$10,192
Nurses	1	12
Nurse salary (annual)	\$750	\$900
Total # home visits	1,567	50,275
Average cost per visit	\$1.05	uk
Home visits per baby (ave.)	5.1	12.9

The babies served at these milk stations represented 0.5 and 2.7 percent of the city population of Portland and Boston, respectively. The percentages of client deaths in the two cities were similar: 1.5 and 2.0 percent. The cost of 1,567 home visits in Portland in 1915 averaged \$1.05 per visit, a 14-cent decrease from the prior year. While 260 infants were served by the Portland milk station and visited by O'Donahue in 1915, Boston's 12 milk nurses averaged 340 infants the year before. To assist their work, Boston nurses received valuable help from tempo-

rary summer nurses and from student nurses through the Instructive District Nursing Association.²⁵ The salary differences between Boston and Portland probably reflected general wage discrepancies within the region: O'Donahue's annual salary was \$750, whereas Boston milk nurses earned \$900.

Many milk station nurses believed their "most important duty (was) that of calling on the well babies and their mothers and making sure that hygienic conditions are as good as possible."²⁶ Nurse O'Donahue often "visit[ed] the sick babies among the poor of the city." In 1915, she made 928 home visits to sick babies and 402 to well babies, an average of five visits (on foot) per afternoon. Initial home visits required extra time to demonstrate specific formulas for modifying milk.²⁷ The nurses' faith in the superiority of their methods never flagged. They restructured the program to meet the realities of women's lives. They explained the formula to the mother, making the lesson practical and concrete by demonstrating sterilization of equipment and adding the required amount of barley and sugar to the milk while the mother observed. Bottled milk was then put on ice. The nurse modified enough milk to last until her visit the following day. Then the nurse supervised as the mother or daughter(s) modified the milk, giving further instruction as needed. Day-to-day interactions with milk station clientele provided immediate feedback useful for modifying materials and maternal education and intervention. Perhaps local observations and experiences had no influence on public policy, but they could affect practical implementation and modifications. Nurses could also easily disguise their instructions in the non-clinic setting: A "conversation of pleasant social nature" would not reveal to "unaware" mothers that nurses had given "fundamental facts" about home hygiene and sanitation.²⁸

Women responded to these intrusions into their domestic and child-rearing domains in various ways. Word-of-mouth in a close-knit neighborhood could promote or sabotage a new program. Mothers in close proximity had opportunities to share opinions or recommend a good idea. Discussions of new methods and perceptions of nurses' visits, no doubt, filtered into

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mothers' social networks. Socializing also caused mothers to make their own modifications of scientific/hygienic practices demonstrated by the nurse.

Personal referrals between mothers suggests a high level of trust and confidence in milk station nurses. During 1915, half the babies who showed up at the Civic Club Milk Station were brought by mothers who had heard about it from other mothers. Nurse O'Donahue reported this optimistic view: "The educational effect on the community is now beginning to be felt. . . mothers whose babies have been helped are referring their friends to the clinic for advice."²⁹ Boston reports showed that 40 percent of new participants in 1914 came from referrals by other mothers and friends; 18.5 percent were referred by Board of Health nurses; 13.5 percent were referred by doctors and hospitals.³⁰

Most public health nurses were single and chose a career instead of or until marriage. There is no evidence to suggest that they displaced the few equally-qualified married nurses who had children. Being unmarried was a "drawback" to these nurses because mothers generally heeded child-rearing advice from neighbor women rather than from educated, single professionals. Some mothers charged that nurses could not know about babies unless they had children of their own. Of the 14 nurses at Boston's milk stations, 12 were single. These milk stations had a high retention rate for nurses. Over several years, there occurred only three nursing personnel changes. Nurses either needed their job, loved their work, had no immediate marriage plans, or all of the above. From an administrative view, it was desirable to retain nurses who demonstrated their suitability to this particular occupation. The Boston supervisor of nurses reported their low turnover rate; some nurses had worked there since the stations opened.

Most of our nurses are unusually well fitted for this work, both by special training and by keen social instinct.... With each additional year comes a better understanding of the neighborhood and its possibilities, a closer cooperation with other

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agencies working in the district and more confidence on the part of the people.³¹

Follow-up home visits were essential. Nurses were able to determine how much time they needed to spend in each home rather than rely on the limited contact at the clinic. Nurses saw only benefits in “being able to sit down and converse with the family...[with] more time at her disposal.” One nurse conceded these visits “might be regarded as an impertinence, there being no reason for it beyond a desire to instruct and so [to] help the mother....”³² Authorities agreed that public health programs had no hope of changing conditions or unhealthy practices unless they emphasized education, which could be impeded by maternal resistance and suspicion. Nurses were determined to remove this suspicion and reduce resistance.

Public health nurses shared an intervention philosophy with other social improvers. They perceived themselves as truly helping the needy and less fortunate and they expected voluntary compliance and cooperation in return for the good bestowed. The “unfortunate” working classes, not inclined to welcome intrusions in their homes, frequently did not share these perceptions and expectations. Social reformers blamed “ignorance” or pointed out cultural differences to explain women’s resistance to new “scientific” ideas.

Despite their sensitive, personable manner, nurses recognized that their greatest obstacle was overcoming mothers’ resistance to interference and advice which was “not always accepted in the spirit in which it was given.” Some mothers “feared to trust their babies...[to the milk station] lest doctors practice on them there.” A nurse’s ability to be tactful and alert to opportunities during home visits encouraged rapport. Home instruction was credited with successfully lowering infant death rates: “It is now an accepted fact that nurses are the natural teachers of efficient motherhood, which covers the most important side of the social-betterment problems.”³³

Nurses collectively revealed their perception that at-home intervention by a caring, respected person posed less of a threat to foreign-born mothers than facing a medical (authority) figure

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in a sanitized center. The caring spirit, patience, and encouragement of the dedicated milk station nurse had a positive effect on families that was difficult to quantify, but nonetheless exerted influence upon the commitment mothers and little mothers showed in adopting hygienic baby care.

In many large urban centers, milk stations prepared educational pamphlets and posters in a variety of languages. These efforts helped “Americanize” the family who did not speak English or who had trouble adapting to new surroundings.³⁴ The ability to speak to a mother in her own language was a plus for a milk station nurse from an immigrant background. She could move freely back and forth across the lines that separated struggling, and often alienated, working-class families from more comfortable “civic improvers” who supported and operated milk stations. Lillian O’Donahue had a distinct advantage as an American-born daughter of Irish immigrants and a member of the sponsoring Portland Civic Club.

Given their investment in home visits, milk nurses were strategically positioned to observe closely and understand the neighborhood. For instance, nurses had to distinguish between patrons able to pay for milk and those needing free milk and to determine which recipient’s pride was wounded by free commodities. Daily interaction in the neighborhood required insight, sensitivity, and decisiveness. Nurse O’Donahue, for instance, recommended a price increase for those able to pay for milk, and she had “a keen appreciation of the care necessary to avoid encouraging dependency on the part of those able to pay.” Neighborhood population changes affected milk station operations before they ceased. By 1917 the proportion of Portland clientele able to pay for milk had increased, “owing to [a] decrease in immigration.”³⁵

A mixture of successes (i.e., reductions in infant mortality) and resistance to “scientific” infant care practices colored many of the milk station reports and narratives submitted by nurses. This reflects the forces of both traditional child care practices within working-class areas and the nurses’ conviction to instill hygienic habits which they believed were essential for positive

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outcomes. Defining areas of success showed that their work was directly linked to beneficial results. Successes also emphasized that mothers were receptive to their teachings.

Milk nurses responded to social reformers' call for "intelligent motherhood." They emphasized what were known as "scientific" principles in child hygiene, care, and feeding. They presumed that mothers universally wanted help in the form of advice, instruction, demonstrations, and home visits to find out what they were doing "wrong." Nurses identified old-fashioned, old-world, and unhealthy child care customs and demonstrated alternate "scientific" practices, "guaranteed" to benefit the child's health and general development. They taught mothers about the causes and prevention of illness and cautioned against overfeeding and against keeping babies too warm. They disapproved of feeding children coffee and tea instead of nourishing milk. Despite the popular belief that babies in tenements were starving, nurses observed that for every starving baby, "there was a hundred that suffer from overfeeding."³⁶

Unfamiliar but practical advice given to mothers about their children's health and development sharply contrasted with old-world customs. However, this knowledge may have helped immigrant women to meet the challenges of urban life and was probably welcomed by the women who embraced the idea of becoming "American." Figures alone do not determine whether these programs empowered or entrapped poor, urban women and children. Recent interpretations of the early social reform movement equate their programs with an attempt at social control and suggest that these efforts fostered poor women and children's dependency upon middle-class reformers, bureaucracy, and paternalistic purveyors of advice. Some nurses' observations support the view that administrators and service providers often paid more attention to the needs of women and children than to their rights. Another interpretation has been ignored: nurses and other women administered local programs and delivered services on a practical, more intimate level, and mothers often appreciated their efforts.

The work of public health nurses and others who dissemi-

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nated educational materials and demonstrated hygienic habits enabled poor mothers to cope and adjust to new surroundings and living conditions as they adapted to urban American life. Nurses' strong humanitarian motives may have been the impetus that empowered mothers to rise above their unsanitary, congested living conditions. Did poor, urban mothers adopt these new ideas and practices in their daily domestic operations? Nurses' reports included excerpts and reprints of mothers' letters and verbal expressions of appreciation. Boston nurses received letters and photographs showing mothers' appreciative attitude toward their "kind and valuable advises [sic]."³⁷

The milk station nurse became an accepted figure at these milk centers and in the neighborhood. She could individualize the operation to fit the particular needs of a specific neighborhood. Nurses also shared an impressive sense of dedication and duty. One milk nurse reported: "Every nurse worked with the definite purpose of keeping all the children in her district well, and many babies owe their lives to the prompt and faithful nursing or to the painstaking supervision of their diet and home life."³⁸ In order to raise the standards of health and child care, they presumed that diet and other cultural habits needed the same upgrade as sanitary conditions.

Unlike social activists, milk nurses did not engage in broad improvement of urban conditions in working-class neighborhoods. Rather, they assumed the poor would remain in congested districts and hoped that disseminating knowledge about daily child care and preventive health practices would improve the quality of life and chances of survival. At their peak in the second decade of the twentieth century, urban milk stations played an active, significant role in baby-saving work. They shifted the public health focus from treating children's symptoms to a concern for prevention, including education and eliminating the causes of disease.³⁹ Although no single factor can be credited with saving young lives and improving health, milk station authorities and nurses attested to the positive impact of intervention upon infant mortality. For instance, Boston's infant mortality rate dropped from 133 (per 1,000 births) to 103

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between 1909 and 1914 (Table 7). Discrepancies in overall infant mortality stem from inconsistent (and not yet mandated) birth and death registrations. Many cities and agencies seemed pleased to produce any figures, while milk stations carefully compiled figures which would justify their program and highlight their accomplishments.

Table 7. Boston Infant Mortality Decline ⁴⁰			
	# of Milk Stations	Participating Infants	Deaths among Participants
1909		738**	n/a
1910	10	1,870	n/a
1911	9	2,827	139
1912	9	3,026	113
1913	12	3,421	n/a
1914	12	4,097	83
** Partial year; program began in May, 1909.			

It is difficult to determine the milk station nurse's success at replacing traditional practices with "scientific" principles. Reporting complete success would have indicated that immigrant mothers did not need nurses and other reformers. Because nurses needed to demonstrate a continuing demand for their services, therefore, annual reports listed accomplishments and areas of weakness targeted for improvement.

By 1920, the need for centers of clean milk distribution disappeared. As cities and regions enacted strict regulations for the supply, transport, and distribution of pure milk, The milk stations were converted to baby welfare clinics. Portland's infant milk station services were discontinued despite reports that its work had a positive impact in the poor neighborhood. Two main factors were at work. The city's milk supply and dealers continued to be strictly tested, and purity standards were enforced. Thus, clean milk replaced dirty milk. Economics also played a

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crucial role. Fiscal statements showed a rapidly rising net cost of maintaining local services:

Fiscal Year Ending	Net Operating Cost
April 1914	\$1,834.01
April 1915	1,650.97
April 1916	2,236.41
April 1917	3,537.71
April 1918	10,892.98

From 1914 to 1916 the milk station had an average annual net operating cost of \$1,907 before the figures began to climb. Extant records give no explanation for the dramatic increase (308%) for April 1917-18. Perhaps, with a declining number of babies and mothers using the services, the increased cost did not justify continued operation.

Some milk stations were transformed into well-baby clinics, also known as child health centers, with passage of the Sheppard-Towner Act (1921). This piece of legislation expanded maternal education by creating thousands of urban and rural maternal and infant health centers between 1921 and 1929. For several decades, these centers continued giving advice on infant feeding and child management, but with two major changes: (1) milk was no longer dispensed to patrons, and (2) they were under government auspices rather than various local welfare societies and philanthropies. These new clinics emphasized preventive health care for infants and provided employment opportunities for public health nurses. People often did not distinguish the infant milk stations, which operated a full decade earlier, from the infant health centers established as part of the Sheppard-Towner Act.

During the 1920s, an elaborate system of public (and private) agencies focused on healthier children, staffed by full-time nurses and part-time physicians. Between 1915 and 1919, 230 child health centers were established; 439 from 1920-1924; and 359 from 1925-29. By 1924 Boston had 30 well-baby centers; New York City had 87 in 1926. By 1930, child health and welfare

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centers had become commonplace, an estimated 1,500 in cities and 2,600 in rural areas.⁴¹ Nearly 70 percent were one-nurse operations, “vulnerable to fluctuations in community support.”⁴²

Some nurses entered the realm of public health service by way of milk station employment and many milk station nurses continued a similar role at child health centers. They faced a two-part challenge: (1) to legitimize their position as experts, and (2) to maintain the need for their services. Many nurses benefited by remaining flexible, transferring their services and dedication to the new health center with the changing focus and perceived needs of public health.

— ACKNOWLEDGMENTS —

The author appreciates encouragement and comments on early versions of this work from Darlene Cooper, Ardis Cameron, Dan Gibbons, James Redwine, and Patricia Smith.

NOTES

¹Annette Fiske, "The Milk Nurse and Her Duties," *Trained Nurse* 46 (1911): 76-79.

²J. W. Kerr, "Data Regarding Operations of Infants' Milk Depots in the United States in 1910," *Public Health Reports* 26 (1911):1227-1245.

³Chester Roadhouse and James Henderson, *The Market-Milk Industry* (NY: McGraw-Hill, 1950), 7; Constance D. Leupp, "The Fight for Clean Milk," *Outlook* 101 (August 1912):190-8; Frank E. Carmichael, "Safety First in Our Milk Supply," *Journal of the Maine Medical Association* 6 (Feb. 1916): 269-75; *City of Portland (Maine) Auditor's 55th Annual Report* (Portland, 1914), 390; (1915), 363-8. It took over a decade for members of the New England Milk Commission to agree on the milk regulations enacted in the mid-1920s. Bacteriologists recommended 10,000 or less bacteria per cubic centimeter. Residents of Portland obtained their milk supply from over 50 local milk dealers. In 1916, only four dealers had acceptable, low bacteria counts. Local physicians monitored "certified milk" standards.

⁴For example, 28% of first-year deaths had gastrointestinal causes from improper feeding and unclean milk, L. Emmett Holt and John Howland, *Diseases of Infancy and Childhood*, 7th ed. (NY: Appleton, 1917), 46-7; and Arthur Howard, "The Importance of Milk Stations in Reducing City Infant Mortality," *Boston Medical & Surgical Journal* 166 (May 1912): 773-5.

⁵Henry H. Hibbs, *Infant Mortality: Its Relation to Social and Industrial Conditions*. (1916; reprint, New York: Garland, 1987). U.S. figures came from inconsistent national data collection. Hibbs' sources included Annual Reports of Health Department, City of New York Dept. of Health, 1910 to 1913; U.S. Census Bureau data and Boston Milk and Baby Hygiene Association reports 1912 to 1915.

⁶"Department of Labor, Children's Bureau, Baby-Saving Campaigns," in *Infant Mortality Series*, no. 1, (Washington: Government Printing Office, 1913), 32.

⁷S. Josephine Baker, M.D. to Julia C. Lathrop, May 6, 1914, Children's Bureau File 4-14-2-3-3, National Archives Washington, D.C.

⁸Thomas J. Burrage, "The Portland Charitable Dispensary and the Portland Tuberculosis Class," *Journal of the Maine Medical Association* 34 (Sept. 1943), 175; Alumni files, Special Collections, Bowdoin College Library, Brunswick, ME.

⁹Burrage, "The Portland Charitable Dispensary," 175.

¹⁰*Portland City Directory* (Portland, Maine), 1904-915; Writers' Program of the Work Projects Administration in the State of Maine, *Portland City Guide* (Portland: 1940), 246-7; *Annual Report, City of Portland*, (Portland: 1910-17); *Report of the State Board of Charities and Corrections*, (1915-1920). The U.S. Census Bureau reported 100 dispensaries in 1900, 574 in 1910, and 700 in 1915. S. S. Goldwater, "Dispensaries: A Growing Factor in Curative and Preventive Medicine," *Boston Medical & Surgical Journal* 172 (1915), 613.

¹¹May Ayres Burgess, *Nurses, Patients, and Pocketbooks: Report of a Study of the Economics of Nursing* (New York: Committee on the Grading of Nursing Schools, 1928), 37-9.

¹²Susan M. Reverby, *Ordered to Care, The Dilemma of American Nursing, 1850-1945* (New York: Cambridge University Press, 1987), 159.

¹³Sandra Beth Lewenson, *Taking Charge: Nursing, Suffrage, and Feminism in America, 1873-1920* (New York: NLN Press, 1996), 54.

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¹⁴Figures reported in Lewenson, 103-4, and Reverby, *Ordered to Care*, 109.

¹⁵Janet M. Geister, "The Part of the Public Health Nurse in the Milk Situation," *Public Health Nurse Quarterly* 10 (July 1918): 320-4.

¹⁶Howard, "The Importance of Milk Stations," 774.

¹⁷For more about this antecedent to well-baby examinations and early criteria for child development standards, see Annette K. Vance Dorey, *Better Baby Contests: The Scientific Quest for Perfect Childhood Health in the Early Twentieth Century* (Jefferson, NC: MacFarland, 1999).

¹⁸The milk station was under the direction of a four-member Civic Club committee. Progress reports were submitted by three women: the club president, committee chairperson, and supervising nurse. "Civic Club of Portland, Maine, Calendar" 1914-15, 1916-17, 1908-09, Maine Historical Society, Ms.P837c6; *Report of the State Board of Charities and Corrections* (Maine, 1917), 192; *Portland Sunday Telegram*, 27 July 1913, 14. The average cost of producing milk in New England states prior to 1920 was five to eight cents per quart. Selling price in Boston (1917) was 10-1/2 cents per quart. *The Milk Question in New England* (Boston Chamber of Commerce, 1917), 9-15, 46.

¹⁹Hasia R. Diner, *Erin's Daughters in America: Irish Immigrant Women in the Nineteenth Century* (Baltimore, MD: Johns Hopkins University Press, 1983), 46. See also Reverby, *Ordered to Care* and Barbara Melosh, *The Physician's Hand: Work, Culture and Conflict in American Nursing* (Philadelphia, PA: Temple University, 1982).

²⁰Annette Fiske, "Milk Nurse and Her Duties, Part II," *Trained Nurse* 46 (March 1911), 147. Elizabeth E. Farrell, "Henry Street Settlement's Contribution Toward the Conservation of Infant Health and Life," *Philadelphia Baby Saving Show and Conference Proceedings* (1913), 242.

²¹Farrell, "Henry Street Settlement's Contribution," 242; *Portland Sunday Telegram*, July 27, 1913, 14; August 3, 1913, 25.

²²Kerr, "Data Regarding Operations of Infants' Milk Deposits," 1236-8; *Portland Evening Express and Advertiser*, March 8, 1916, 16.

²³Howard, "The Importance of Milk Stations," 774. See also Sydney Halpern, *American Pediatrics: The Social Dynamics of Professionalism, 1880-1980* (Berkeley: University of California Press, 1988), esp. chapter 4.

²⁴*Report of the State Board of Charities and Corrections* (1916), 261-2; *Boston Milk and Baby Hygiene Association, Annual Reports* (1915), 13-15.

²⁵*Boston Milk and Baby Hygiene Association, Annual Report* (1915), 36; (1914), 37.

²⁶Fiske, "The Milk Nurse," 77.

²⁷*Report of the State Board of Charities and Corrections* (1916), 261-2.

²⁸Elisabeth Shaver, "How One City Saves Its Babies," *American Journal of Nursing* 11 (April 1911): 546-8.

²⁹*Report of the State Board of Charities and Corrections* (1917), 193; *Portland Evening Express and Advertiser*, March 8, 1916, 16.

³⁰*Boston Milk and Baby Hygiene Association, Annual Report* (1915), 13-15; Fiske, "The Milk Nurse," 77.

³¹*Boston Milk and Baby Hygiene Association, Annual Report* (1915), 31.

³²Fiske, "The Milk Nurse," 76-9.

³³Annie E. Kennedy, "From the Nurses' Standpoint," *American Journal of Nursing* 9 (March 1909), 423; Mary E. MacDonald Carter, "The Nurse's Part in the Campaign for Reduction of Infant Mortality," *Trained Nurse* 48 (Feb. 1912), 78; "For Better Babies in Texas," *Survey* 31 (Jan. 10, 1914), 438.

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³⁴M. A. Gallagher, "An Italian Milk Station," *American Journal of Nursing* 11 (April 1911), 548-50. For more on the Americanization campaign see Elizabeth Ewen, *Immigrant Women in the Land of Dollars: Life and Culture on the Lower East Side, 1890-1925* (New York: Monthly Review Press, 1985) and Doris Weatherford, *Foreign and Female: Immigrant Women in America, 1840-1930* (New York: Schocken Books, 1986).

³⁵ *Report of the State Board of Charities and Correction* (1917), 192-3.

³⁶E. Ida McCune, "How Certified Milk Lessens Infant Mortality," *Nursing Journal of the Pacific Coast* 7 (January 1911):19-23; Janet M. Geister, "The Part of the Public Health Nurse in the Milk Situation," *Public Health Nurse Quarterly* 10 (July 1918): 320-4.

³⁷*Boston Milk and Baby Hygiene Association, Annual Report* (1915), 32, 33, 37.

³⁸Shaver, "How One City Saves Its Babies," 546.

³⁹Howard, "The Importance of Milk Stations," 774.

⁴⁰*Boston Milk and Baby Hygiene Association, Annual Report* (1915), 4, 11, 16. Number of deaths for previous years are not available. (Reported by milk station administration)

⁴¹Halpern, *American Pediatrics*, 85-6.

⁴²Karen Buhler-Wilkerson, "Home Care the American Way: An Historical Analysis," *Home Health Care Services Quarterly* 12 (1991): 5-17.