

Henrico Health Department

History

Introduction

In May of 1610, the leaders of the “Colony in Virginea Britannia” included in their “Lawes Divine, Morall and Martiall” that:

“Ther shall no man or woman, Launderer or Launderesse, dare to wash any uncleane Linnen, drive bucks, or throw out the water or suds of fowle cloathes, in the open streete, within the Pallizadoes, or within forty foote of the same, nor rench, and make cleane, any kettle, pot, or pan, or such like vessell within twenty foote of the olde well, or new Pumpe: nor shall any one aforesaid, within lesse than a quarter of one mile from the Pallizadoes, dare to doe the necessities of nature, since by thse unmanly, slothfull, and loathsome immodesties, the whole Fort may bee choaked, and poisoned with ill aires, and so corrupt (as in all reason cannot but much infect the same) and this shall they take notice of, and avoide, upon paine of whipping and further punishment, as shall be thought meete, by the censure of a martiall Court.” (Library of Virginia)

Clearly expressed, within the old English, is a concern for the public health (“the whole Fort may bee choaked and poisoned”) posed by contamination of the water supply (“throw out the water or suds... within forty foote of the olde well”) and the disposal of sewage (“within lesse than a quarter of one mile from the Pallizadoes, dare to doe the necessities of nature”). In 1611, when the colony expanded upriver to the Citie of Henricus (later the Shire of Henrico), their early development included “Mount Malady”, believed to be the first English hospital in the new colony.



This facility provided beds for care of new arrivals to the colony and ill members of the community while keeping them separated from the settlement to prevent the spread of disease (www.henricus.org) a public health practice now referred to as isolation or quarantine.

This concern for public health and disease prevention in the new colony continues today in the authority and activity of the Henrico Health Department and public health practice throughout the Commonwealth. Public Health practice endeavors to prevent disease and assure the health of the community as a whole. Examples of disease prevention activities include surveillance, investigations, and regulations for the prevention of waterborne (e.g., cholera), foodborne (e.g., E. coli, Salmonella), vectorborne (e.g., rabies, West Nile Virus), and person-to-person spread of communicable diseases (measles, tuberculosis, influenza, HIV). The Public Health system has evolved over time to assure safe drinking water and sewage disposal for homes, childhood immunizations, maternal and child health initiatives, tuberculosis control, rabies prevention, and, food safety in restaurants. Though threats to community health may change over time and in response to control efforts, from cholera to polio to tuberculosis to HIV/AIDS to a resurgence of tuberculosis, public health servants continue to monitor and act to control known and emerging health threats.

“Public health looks at illness and other risk factors in aggregate populations and comes up with wholesale solutions, such as changing the environment through water improvement or changing the resistance of the population to a certain disease through a mass immunization campaign. Its philosophical base is social justice, and its scientific base is epidemiology.” (William H. Foege, House on Fire: The Fight to Eradicate Smallpox)

Public Health practice in Henrico has evolved in size and scope as the community has developed from a colonial outpost, to a sparsely populated, predominately rural county, to its present mix of rural, suburban, and urban lifestyles and land uses. As our population has increased, aged, and become more diverse, and our medical care and technology has become more complex, there have been significant positive (and some negative) impacts on our health and life expectancy. Nevertheless, many of the historic public health concerns continue to pose health threats to our community.

The Henrico Health Department

Henrico Health Department has been the lead agency for public health practice in Henrico County since 1934, though there are, and have been, many partners also providing public health services to Henrico citizens. One especially significant partner in the provision of public health services is the Virginia Department of Health, which provides program policy and leadership, partially funds the local health department budget, and operated the “County Health Unit” prior to 1934. Other partners include: hospitals and private physicians which report cases of specific illnesses for investigation; pharmacies which dispense vaccines and prescription drugs and assist in outbreak planning and response; Henrico Animal Protection Officers who investigate animal bites, enforce rabies vaccination of dogs and cats, and quarantine biting animals; Medical Reserve Corps volunteers who provide assistance in response to large-scale public health threats; and, private sector contractors who design and install private wells and onsite sewage disposal systems.

In 1935, at the end of its first year of operation, Henrico Health Department reported nine employees and expenditures of \$17,530, serving a population of 35,400 in an area of 280 square miles (126 persons/square mile). By 2011, Henrico Health Department consists of 68 full-time employees and expenditures of \$5,600,000, serving a population of 306,935 and an area of 245 square miles (1,253 persons/square mile), a nearly ten-fold increase in population density. In 1935, the Health Department's organizational structure consisted of Dr. J.C. Neale, Jr., Health Officer, a Sanitation Officer, nurses, and supporting staff. Today's organization maintains those principals with Dr. Susan Fischer Davis, Director of Health, a team of Environmental Health Specialists, a team of Public Health Nurses, and a supporting staff in a Business unit and within the disciplines of Environmental Health and Public Health Nursing. Additions to the public health team include Dentists, Nutritionists, Epidemiologists, and Emergency Planners.

Despite significant changes in population and technology, many of the basic public health services reported in 1935 remain key themes in our public health services today. Those key themes or public health challenges "then and now" include: safe drinking water and sewage disposal; control of communicable diseases such as measles, tuberculosis, influenza; maternal and child health; and, surveillance and response to disease occurrences and trends. The public health response to these challenges can also be expressed as: prevention of waterborne disease; prevention of infant mortality; prevention of communicable diseases; epidemiologic surveillance; and, maintaining birth and death records. Recently expanded public health challenges include the HIV epidemic, emergency preparedness for emerging diseases and bioterrorism, and safe food service in the rapidly expanding foodservice industry.

Public health practice: Safe Drinking Water and Sewage Disposal

If the "Sanitation Officer" of 1935 and a current "Environmental Health Specialist" (the Sanitation Officer role, changed to Sanitarian in the 1950s and Environmental Health Specialist in the 1990s), were to meet and discuss their responsibilities and concerns, they would likely find much in common whether it be recommending sites for new wells or designing and inspecting septic systems or investigating citizen's complaints of health threats. Though the Sanitation Officer would be amazed at the increased complexity of soils evaluations and available treatment technologies, he would certainly recognize the continued concern for protecting wells and treating and disposing of sewage in a safe manner.

As residential and commercial development expanded in Henrico, there was a division of responsibility in the public health goal to assure safe drinking water and sewage disposal. The construction and operation of water supplies and/or sewage disposal systems serving multiple connections were regulated by sanitary engineers in the Virginia Department of Health. Construction and operation of individual water supplies (wells) and/or sewage disposal systems were regulated by sanitarians (later Environmental Health Specialists) in the Henrico Health Department and is the subject of this history.

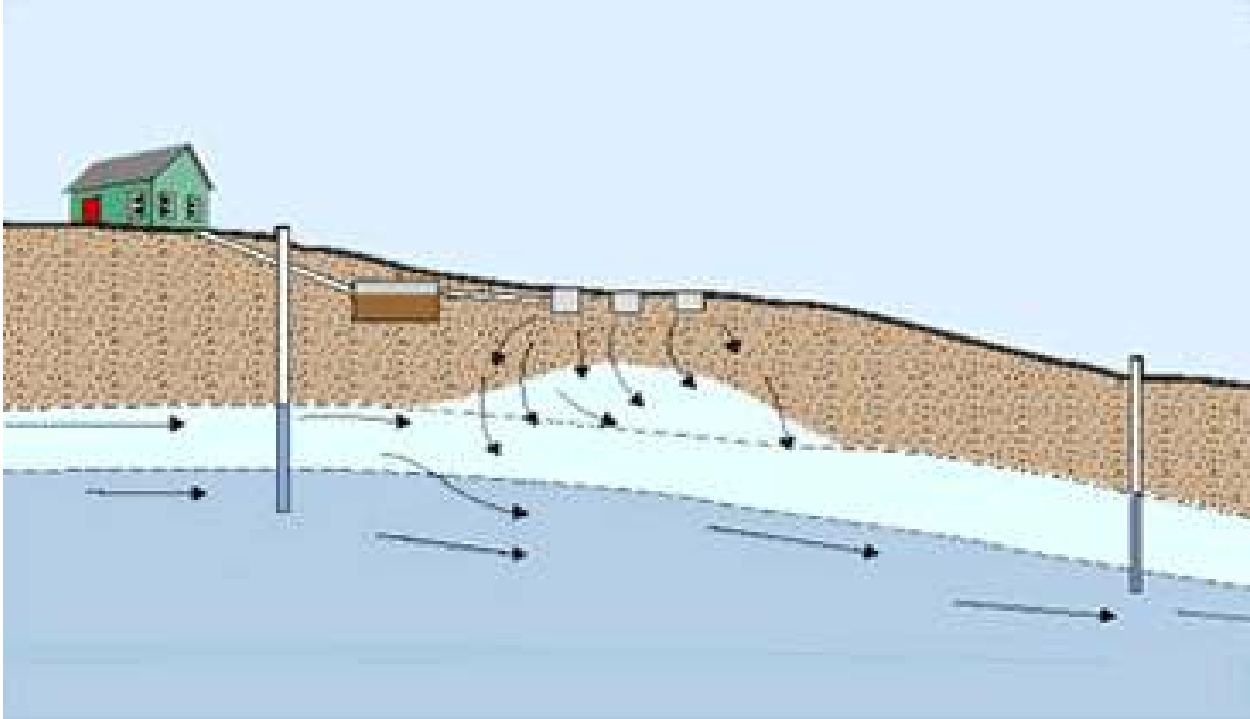
In 1935, the Henrico Health Department reported that, “An effort has been made during the past six months to replace old box and can privies with new standard pit type privies whenever existing conditions will permit... 3,639 visits were made to the homes in the County by the Sanitation Officer securing 497 improvements in sanitation... Due to the changing conditions in the County it was found advisable to revise the ordinance on sanitation with especial reference to septic tanks. The new ordinance... sets definite minimum sizes for septic tanks and gives the Health Department entire control of the number of feet of drainage tile and use of absorption material.” (Annual Report, 1935)

A “box and can” privy is similar to the chamberpot of years before. Located within the house the box, with a rough cut-out or toilet seat, contained the can which received the human waste. The can was then removed and either dumped into an outside pit or collected by a scavenger service. The “new standard pit type privies” (aka, outhouses) were outdoor structures in which human wastes were deposited into a pit. For both types of privies the volume of waste was only that of the urine and feces produced by the bodies of the users, consequently the primary public health threat was spread of disease by flies gaining access to human waste.



1940 WPA Community Sanitation Poster promoting sanitary outhouse designs (Wikipedia)

As more homes installed running water and water-carried sewage disposal (flush toilets, septic tanks, drainfields) the primary public health threat became the contamination of groundwater by the 400-600 gallons of wastewater/sewage produced daily by the households. This continues to be a public health challenge for residential development in areas of Henrico not served by public sewer.



The figure above depicts the relationships of groundwater flow, septic tanks, drainfields, and wells for a conventional septic tank and drainfield. Notice that the downslope well could potentially receive sewage-contaminated groundwater depending upon its distance from the drainfield and whether the wastewater has been adequately filtered by movement through unsaturated soil (brown). Since 1995, there have been significant advances in treatment units for single-family residents which can provide 90% reductions in bacteria, viruses, and nutrients, prior to the dispersal of treated wastewater into the soil. These technologies allow residential development on sites previously considered unsuitable for conventional septic systems.



In the picture of new construction above, notice the plastic peat biofilter modules. They are installed slightly above original ground level so as to provide filtration of the septic tank effluent prior to dispersal in unsaturated soil. After landscaping, these treatment units are not as noticeable. This, and other, new treatment technologies allow for safe dispersal of wastewater in areas of higher seasonal water tables.

The public health goal to assure safe drinking water by protecting the groundwater in a drinking water well is unchanged from 1611 to the present. The requirements and technology by which we achieve that goal, however, has changed dramatically from the 1611 prohibition on “throw(ing) out the water or suds... within forty foote of the olde well”, to the 1935 “new standard pit type privy”, to the 2011 peat biofilter or aerobic treatment units.

Public health practice: Control of Communicable Diseases (Epidemiology)

Although disease patterns in Henrico County have changed significantly since 1935, many of the goals of communicable disease control remain the same in 2011 as they were in 1935. The 1941 Annual Report from the Henrico Health Department indicates “The public health methods used to reduce the number of cases of communicable disease are: (1) To restrict the contacts of known cases and carriers to prevent the spread of infection; (2) To educate the public in the ways an infection spreads and the method of safeguarding against infection; (3) To immunize susceptibles against those diseases for which a practical and effective method of immunization has been devised.”

Each of these methods continues to remain important to communicable disease control in 2011.

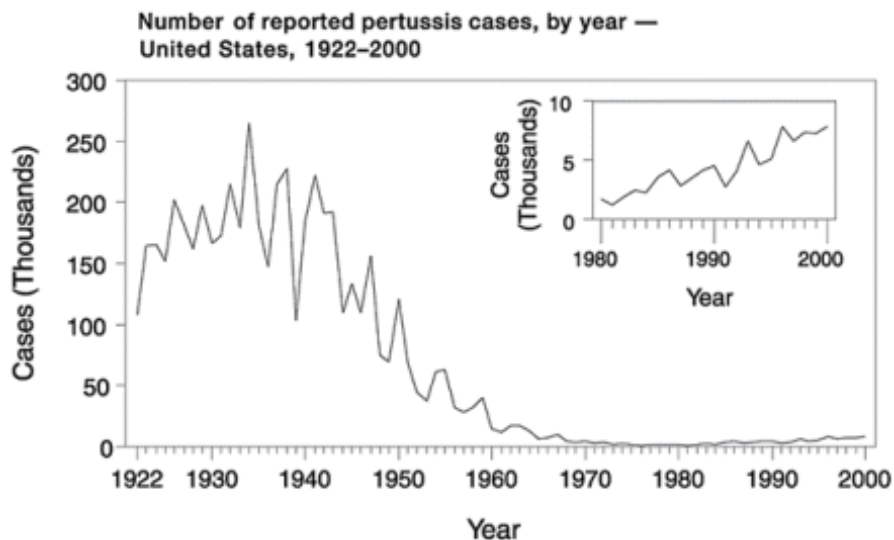


Public Health Nurse rushes Polio Vaccine to Dabbs House where children receive free shots.

As noted in the 1935 Annual Report from the Henrico Health Department, “All communicable disease cases were visited, and as complete an epidemiological investigation as possible was made...It is believed that quite accurate reporting of communicable diseases is being made because of the cooperation of the practicing physicians of the county.” Seventy-five years later, the Henrico Health Department continues to work closely with practicing physicians and local hospitals and laboratories to ensure communicable diseases are reported in an accurate and timely manner. The majority of the time, receiving physician and laboratory reports is the first step in a communicable disease investigation. After receiving a communicable disease report, epidemiological investigations are conducted to identify risk factors for the patient’s infection, the source of the patient’s infection, if others are at risk of becoming ill, and if the patient works in a setting that could easily facilitate the transmission of infection. In addition, the patient is educated about his/her infection, methods to prevent future infection, and steps to prevent disease transmission to others, mirroring the public health actions taken by the health department in 1941.

Since 1935, great strides have been made in communicable disease control. With the goals of reducing morbidity (the state of being ill or disabled) and mortality (deaths) due to infectious diseases, two examples of highly successful communicable disease control programs are pertussis (whooping cough) and measles. Pertussis is a respiratory illness caused by bacteria that affects people of all ages and is characterized by severe coughing. It is spread through the air in droplets produced during sneezing and/or

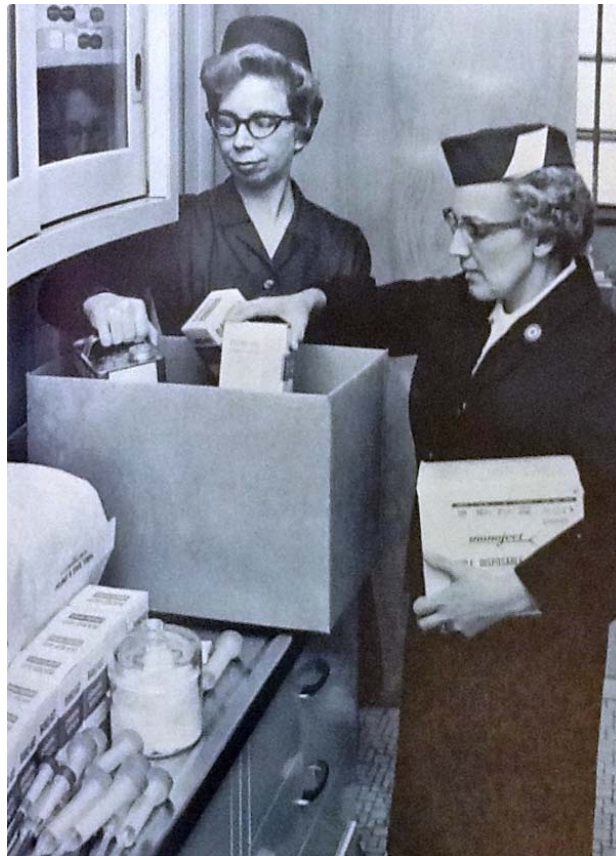
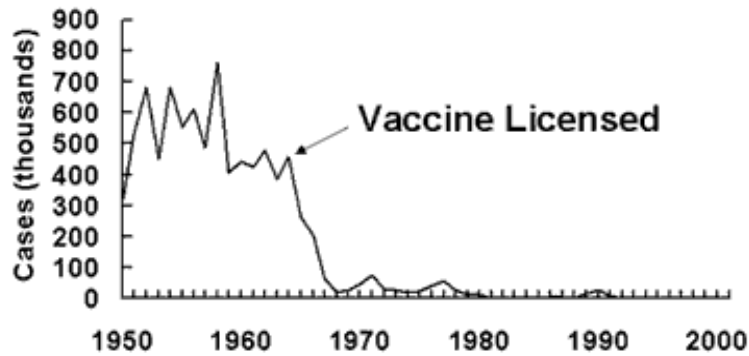
coughing. Although pertussis is usually not a life-threatening illness, it can be very serious in infants (less than one year of age) and in individuals with compromised immune systems or chronic medical conditions. Periodic outbreaks of pertussis occur every 3 – 5 years. Pertussis can be prevented by immunization with pertussis vaccine. The following figure from the Centers for Disease Control and Prevention (CDC) shows the decline in pertussis cases across the United States from the 1920's to 2000, undoubtedly the result of thorough epidemiologic investigations and public health measures focused on vaccinating susceptible individuals.



The control of measles is another example of a successful communicable disease control program. Measles (also known as rubeola) is a highly contagious respiratory disease caused by a virus that is spread through the air or by direct contact with nose or throat discharges from someone who is infected. Measles often causes fever, runny nose, cough, and rash all over the body and rarely can lead to more serious complications, including pneumonia and encephalitis (inflammation of the brain). For every 1,000 children who get measles, 1 or 2 will die. Other rash-causing diseases are often confused with measles.

A single antigen measles vaccine (i.e., a vaccine protecting against only the measles virus) became available in 1963. The MMR (measles, mumps, and rubella) vaccine was developed in 1971. Before a measles vaccine became available, over 90% of children less than 20 years of age had been infected with measles. In the decade before the measles vaccination program began, an estimated 3-4 million people in the United States were infected each year, of whom 400-500 died, 48,000 were hospitalized, and another 1,000 developed chronic disability from measles encephalitis. Widespread use of measles vaccine has led to a greater than 99% reduction in measles cases in the United States compared with the pre-vaccine era, and in 2009, only 71 cases of measles were reported in the United States. These numbers are reflected in the following figure from the CDC, which shows a significant decrease in the number of measles cases after licensure of the measles vaccine.

Measles—United States, 1950-2001



Henrico nurses load up for “Stop Measles” program (1967)

Public Health Practice: Infant Mortality and promoting Maternal and Child Health

Infant mortality is the number of infants who die during their first year of life. Infant mortality is measured by infant mortality rate, which is the number of infant deaths per 1,000 live births (<http://city.milwaukee.gov/InfantMortality.htm>). This is normally accepted as a measure that reflects the general health (public health) and wellbeing of populations within a defined territory or place.

Contemporary public health services began in the middle of the nineteenth century in response to the squalid conditions that existed in the rapidly growing cities and towns of the industrial revolution (<http://www.deathreference.com/Nu-Pu/Public-Health.html>). One can imagine the ecological and environmental problems created by the rapid increase in population densities. Soon there emerged evidence that unsanitary conditions led to outbreaks of diseases due to the unsafe management and disposal of waste and other population filths. Infant mortality, as an indicator of the overall wellbeing of the community was also impacted by the prevailing conditions of the era.

Beginning in 1934, the early years of Henrico Health Department were also the years of the great depression in the US. With 25% of the population out of work in the US, health care became less affordable to many and these conditions posed a risk of increased infant mortality. Despite the prevalence of malnutrition and tuberculosis, this period marks the beginning of a significant decline of infant mortality rates. Public Health studies of the great recession era suggest that population health is better when economic activities are low and may be adversely impacted by rapid expansion of economic activities. Economic expansions have been linked to increases in smoking and alcohol consumption, reductions in sleep, and increases in work stress related to overtime and faster and more strenuous labor, all of which are associated with adverse health outcomes and mortality among healthy persons, persons with underlying chronic disease, including women of child-bearing age and their infants.

Henrico infant mortality data in the 1930s follows a similar trend showing a general decrease over time. The overall infant mortality in Henrico fell from an average of 66.68 for the period 1930-1934 to 8.0 for the period 2005-2009. Also, the disparity between Caucasian and African American infant mortality rates for the two periods were greatly reduced. During the period 1930-1934, the infant mortality rate for African American infants was 60.44 deaths (per 1000 live births) higher than for Caucasian infants. During the period 2005-2009 that disparity had diminished to 8.5 more infant deaths. Though the decreases are significant success, Public Health practice continues to seek healthy infants through prenatal nutrition and care.

If 1935's "Nurse" and 2011's "Public Health Nurse" were to meet, they would likely find much in common relating to prenatal care in Henrico. Though the Nurse would be surprised to learn of the current treatments and the provision of care in clinics rather than home visits, she would recognize the continued concern for the health mothers and babies. A comparison and contrast of the 1935 Nurse and the Public Health Nurse (PHN) of 2011 would see many similarities and many differences. The differences include the educational level of the nurses, the community resources utilized by the current Public Health Nurses in completing their daily job responsibilities, the response available to the PHNs in addressing the infant mortality rate, the science and technology available to provide prenatal care to the patients and the diversity of the population that the health department serves.

In 1935, the nurse providing care in Henrico Health Department probably received practical nursing “training” from a hospital and received her diploma from that hospital upon graduation. University educated nurses were a rarity in 1935. Today, in 2011, the Henrico Health Department employs nurses of all levels of education. Nurses are no longer “trained.” They are now “educated.” In addition to License Practical Nurses (LPN’s) and hospital educated registered nurses (Diploma), Henrico Health Department employs registered nurses educated at the community college level (AD – Associate Degree), university educated registered nurses (Bachelor of Science in Nursing – BSN), Master’s Degree prepared registered nurses (Master of Science in Nursing – MSN) and advanced practice registered nurses (Women’s Health Nurse Practitioners). In addition to providing prenatal care, these highly educated and experienced nurses are active in all programs available at the health department.

While providing prenatal care in 1935, the nurse relied heavily on her own creativity, ingenuity and intelligence while providing that care primarily in the home. Community resources such as churches, the patient’s family members and neighbors were the nurse’s support system and she would utilize them whenever possible. The nurse in 1935 was supervised by a community physician who probably did not specialize in obstetrics. Medical specialties were not popular at that time. In 2011, the PHN in Henrico Health Department primarily provides prenatal care in the clinic at the health department and has at her disposal a variety of public, private, religious, not for profit and commercial organizations and agencies on which to depend when tending to her patient’s/family’s whole individual needs. Henrico Health Department has always provided prenatal care to the indigent and medically underserved. In 1935, that population was of only 2 racial/ethnic backgrounds, white and black. Today, the PHN cares for a diverse multilingual and multinational population. This results in very challenging experiences. As in 1935, the PHN today must depend heavily on her creativity, ingenuity and intelligence when providing care to this diverse community. In addition to PHN’s, the prenatal care is provided by physicians from VCU Medical Center and Women’s Health Nurse Practitioners. The current PHN continually networks with and develops working relationships with agencies and individuals in the community that would be of benefit to her clients in the community.

Birth rates per 1000 Population

Race	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
White	11.5	10.8	10.5	9.3	8.4	6.3	8.5	6.1	12.2	13.0	16.1
Colored	18.2	19.7	20.2	18.0	16.1	19.7	15.9	18.8	15.5	17.4	15.0
Total	12.2	12.5	12.5	10.9	9.9						

Infant Mortality Rates (Deaths per 1000 live births)

White	66.4	51.5	29.2	43.8	45.9	46.0	27.0	43.4	32.5	35.4	35.6
Colored	144.0	106.8	74.1	132.2	83.3	63.0	93.4	126.9	92.1	97.0	117.6
Total	89.1	69.5	44.0	72.5	58.3						

As in 1935, the PHN today strives to eliminate those causes of infant mortality if possible. Through patient risk assessment and community education, there have been

improvements over the years. Today, the PHN participates in community activities whose goals are to find ways to decrease fetal and infant deaths in the community. Currently, there is a regional approach to the reduction of fetal/infant mortality. Through review of medical records of the mothers and babies, a regional team of consumers and professionals are able to develop possible causes/contributory factors that may have led to that loss. These factors are then presented to a group of interested community members called a Community Action Team (CAT) who then take this information back to their own communities to raise awareness about fetal/infant mortality and to encourage others to utilize practices that help to reduce mortality. These activities could not be accomplished without the hard work of the community members, the PHN and the partnerships with VDH and VCU. As in 1935, the PHN's of today grieve with the families for their losses.

In 2011, the PHN's of Henrico Health Department reap the benefits of advancements in science and technology, of which the nurse in 1935 could not have ever imagined, that are currently available to increase the chances for an at risk pregnancy to have a positive outcome. Through the use of ultrasound and other antenatal testing, the health of the mother and the unborn baby can be evaluated. Physicians and nurses are highly educated and specializing in the areas of obstetric, fetal and neonatal health care. New medications have been developed to prevent preterm delivery in at-risk pregnant women and to treat the preterm infant at risk for breathing difficulties. Most recently, many results of the human genome research have broadened the knowledge base of specialists who care for at-risk pregnant women, the fetus and neonate. Through the partnership with VCU Medical Center, Henrico Health Department is very fortunate to be able to make these health care advancements available to all of its prenatal patients.

Public Health Practice: Tuberculosis Control

In our present day of collaborative efforts toward a common goal, it would be wonderful to collaborate with the first nurses and medical staff of Henrico Health Department to discuss shared goals for tuberculosis (TB) treatment. Henrico County Health Department's current goal is that of VDH TB Control Program: to control, prevent, and eventually eliminate tuberculosis from the Commonwealth of Virginia. The Program aims to detect every case of TB in Virginia, assure that every case is adequately and completely treated, and prevent transmission of TB in communities. The ongoing themes of Control, Prevention, Surveillance, and Education were as important then as they are now. Those that "came before" would likely be proud and amazed at all that has been accomplished. I know that I am in awe of the first Public Health efforts and accomplishments made with so few resources.

Tuberculosis is airborne communicable disease caused by the bacteria *Mycobacterium Tuberculosis*. TB generally affects the lungs, however it can affect other body organs as well. Robert Koch discovered this as the bacteria causing TB in 1882. TB is believed to have been causing disease and death for thousands of years.

In 1631, an act for the collection of Vital Statistics was passed by the Colony of Virginia. This law required collection of birth records and death records to be forwarded to the State auditor each year. In 1872 Legislation creating the State Board of Health of Virginia was passed. Henrico Citizens prior to the institution of Henrico Health Department fell under Virginia State jurisdiction.

Early Henrico County records, "The Annual Report of the County of Henrico", show that Henrico tracked TB death rate as deaths per 100,000 population with the counts reported in two categories: "White" and "Colored". These stats indicate TB death rate documentation as early as 1930.

Henrico TB Stats 1930-1940 (deaths per 100,000)

Year	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
W	45.7	27.8	38.9	29.5	34.5	38.3	42.1	92.1	34.4	26.9	21.1
C	245.3	227.9	119.4	44.1	59.7	89.5	104.9	119.4	104.4	28.2	44.1

What was happening then? Clearly one can see that TB numbers were higher in African Americans (reported as "C or Colored") than Whites in the early 20th century. Steven J. Hoffman writes in the Journal of Social History *Progressive Public Health Administration in the Jim Crow South: A Case Study of Richmond Virginia, 1907-1920*, African Americans only benefited marginally from the Public Health Advancements of three new Campaigns against TB, Typhoid, and Infantile Diarrhea at the time. This was felt to be related to Southern Whites believing that African Americans were responsible for their own medical problems, either by inheritance or their behaviors. The fact that TB is contagious rather than hereditary was proven by Frenchman Jean-Antoine Villemin in 1868. Fortunately, today we are not as slow to initiate new innovative treatments as were our early forefathers. Another article, *The Tuberculosis Experience of African-Americans in Virginia*, written by Lindsey Dene Gertz, states that during the construction of the Piedmont TB Sanatorium it was felt that the African-American population may not be receptive to being diagnosed and treated due to differences in cultural beliefs. Lindsey Dene Gertz states that African-Americans had earlier traditions of treating medical problems according to superstition and folk regimens. This correlates to history's accounts of lack of access to medical care for African-Americans and the indigent. Today, Henrico Health Department TB program nurses must learn cultural beliefs of such a diverse base of patients that come to us from around the world. Many persons in 2011 are still fearful of modern medicine.

The Great Depression and World War II were significant events in which Henrico County saw increases in TB deaths. Prior to the 1930's there were no reliable treatments for TB. Doctors may have prescribed bleedings, purging, rest, improved nutrition, and time outdoors. Sanatoriums were an option for treatment for Virginia white residents in 1915, when Catawba Sanatorium opened near Roanoke and later, in 1918, African-Americans were offered the opportunity for treatment at Piedmont Sanatorium.

The 1935 Annual report stated it was the first time that two individuals were forced into the hospital for treatment. Today, Henrico also has in effect TB laws to protect the public when a patient may decide to decline treatment for a contagious respiratory disease.

The use of X-ray screening was noted to be in effect during 1961, and the picture (below) from that time suggests a lack of the laws in effect by OSHA regarding monitoring of radiation and protections for the screener and those surrounding.



Education for reduction of TB prior to the development of a cure for TB was instrumental in communicating knowledge of how TB is transmitted. The Virginia Anti-Tuberculosis Association's Campaign highlighted the fact that "Hundreds Die of Consumption because Spitting spreads Disease: Do not spit yourself-Ask others to stop." This campaign included a statement: "Write for information on Consumption". Currently, Henrico Health Department utilizes educational tools provided by Virginia Department of Health's Division of TB Control. These educational materials are provided either in printed pamphlets or online in a multitude of languages. Also, information is provided by Centers of Disease Control in multimedia via brochures, videos, DVD's, etc. Though the nurses of the 30's would be amazed at our current computer technologies, education was a key element utilized in the TB sanatoriums for Henrico citizens. They taught that TB was spread in sputum and taught "sputum control". It was the desire of

the TB Sanatoriums that the education of the patients would get back to the community as well. Currently, Henrico TB nurses, as well as Outreach workers, also teach how TB is spread to patient and family members.

Screenings done by the administration of the TB Skin Test became a standard in 1941. 1943 brought about the beginning of a large reduction in TB deaths due to the development of Streptomycin, the first antibiotic that treats TB. Streptomycin as a treatment eventually led to the closure of TB Sanatoriums. Newer antibiotic therapies soon followed. Additional antibiotics were important to the treatment of TB, as it was discovered that resistance began to occur within months of using one drug treatment. Research soon led to the discovery that treatment with more than one drug could overcome the problem of drug resistance. The newer drugs developed included: in 1949 p-aminosalicylic acid; in 1952 Isoniazide; in 1954 Pyrazinamide; in 1955 Cycloserine ; in 1962 Ethambutol ; and in 1963 Rifampin.

Henrico Health Department currently uses standard 4 drug therapy for TB treatment for non resistant TB: Isoniazide; Rifampin, Pyrazinamide, and Ethambutol. Henrico Health Department uses current lab facility of DCLS (Division of Consolidated Laboratory Services) to provide diagnostic findings for sputum staining, smears, and culture reports. Sensitivity testing is an important factor in TB treatment, as within 2 months it reveals whether the current treatment is effective in killing the patient's TB bacteria. For complex drug resistant cases of TB other drugs available to us now, including aminoglycosides such as capreomycin, viomycin, kanamycin and amikacin, and the newer quinolones, are effective.

With the new arsenal of antibiotic therapies; TB rates continued to decline until 1985 when the trend reversed and TB rates began to climb. Factors that contributed to this increase include: HIV/AIDS epidemic; immigration from countries with high TB occurrence; congregate settings such as jails, prisons, homeless shelters; and, a decrease in federal financial resources to assist State and County TB Control efforts. The statistics clearly indicated a need for more resources, which were delivered starting in 1992. Federal resources to fund State and local TB control efforts included support for TB prevention among persons with HIV, TB screening, and preventive therapy for those at high risk for TB infection. There is continued need for TB funding in order to continue detection, screenings, and treatment. Henrico County continues to receive large numbers of foreign born citizens (legal and illegal immigrants and refugees) coming into our county from Countries with high incidence of TB.

Henrico TB Stats 2006-2010 (deaths per 100,000)

2006	2007	2008	2009	2010
10	7	8	5	9

Despite the remarkable decline in TB death rates, from a total of 290 deaths per 100,000 in 1930 to 9 deaths per 100,000 in 2010, Henrico Health Department continues to screen for TB. With current funding and staffing, Henrico Health Department screens

those with positive sputum stains, symptomatic individuals, contacts to TB cases, refugees settling into Henrico County, legal immigrants, and other high risk individuals. Henrico Health Department currently is using the following screening tools: symptom screening, x-rays contracted with partner Henrico Doctors or received from a multitude of facilities or Medical Practices, Mantoux TB skin test, T-spot or Quantiferon (blood test results); Sputum AFB smear, culture and sensitivity tests sent to our State Lab, MTd probes, TB DNA, Interpreters, Language Lines. Henrico TB team of the 30's.....We've come a long way!

A question to those public health practitioners of the 1930's would be "How in the world did you manage with so little?" What we would most want to share with our public health predecessors would be the fabulous TB team at Henrico Health Department and those community partners that we work with each day. Each person's experiences and knowledge add to the quality of care that we are able to provide to our diverse TB clients that we serve daily. We look forward to what is in our future.

Public health practice: Food Safety

In 1938, Henrico Health Department Sanitation Officers report site visits to 67 "food and drink" establishments, but no authority to enforce food safety practices for these facilities. By 1944, Henrico County had enacted a food safety ordinance mandating inspections and food safety practices for places serving food to the public. By 1950, the Code of Virginia required a permit from the local health department and compliance with food safety regulations enacted by the Board of Health. Since then, the permitting, inspection, and assurance of safe food preparation in facilities serving food to the public (e.g., restaurants, school cafeterias, child/adult care centers, caterers, etc.) has been an ever-expanding responsibility of the Environmental Health program within the health department.

By 2011, a team of seven Environmental Health Specialists works to assure safe food service and sanitary conditions in over 1100 facilities which serve food or provide care to the public. Education and enforcement activities address known risk factors for foodborne illness including: purchasing food from unsafe sources; failing to cook food adequately; holding food at incorrect temperatures; using contaminated equipment; and practicing poor personal hygiene.

Conclusion

Henrico Health Department continues a 400 year tradition, from colony to shire to state and county, of public health protection and assurance activities. Through dramatic changes in population, disease trends, treatments, tools, and technologies the foundations of public health, understanding the causes and methods of transmission of disease and coordinating action to protect the community, remain consistent. Our mission, for today and the future, is "Protecting You and Your Environment".

Appendix

Henrico Health Officers and Directors:

1934 to 1935, Dr. J. C. Neale, Jr., Health Officer
1936, Dr. J.N. Dudley, Health Officer
1937 to 1938, Dr. John D. Hamner, Health Officer
1940 to 1946, Dr. J. H. Crouch, Health Officer
1948 to 1950, Dr. R. M. Wilson, Health Officer
1951 to 1954, Dr. F. A. Blesse, Health Officer
1954 to 1964, Dr. Beverly F. Eckles, Health Officer
1967 to 1970, Dr. James A. Smith, Director of Health
1971, Dr. Murray W. Ballenger, Director of Health
1972 to 1974, Dr. George H. Agate, Director of Health
1976 to 1978, Dr. Martin Cader, Director of Health
1978 to 1990, Dr. Forrest Pitts, Director of Health
1991 to 2004, Dr. Curtis Thorpe, Director of Health
2005 to 2009, Dr. Mark Levine, Director of Health
2009 to present, Dr. Susan Fischer Davis, Director of Health

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