

Caring for Children with Infectious Diseases: Children's Experiences of Fever Hospitals and Sanatoria in Scotland.

Introduction

“We had nothing to do all day except wonder if we would ever get out or if we would die. Every night was the same—screaming children—and by the morning several more were dead.”¹

These were the recollections of a retired deputy medical officer of his time as a twelve-year old child in Shieldhall Fever Hospital, Glasgow, during the scarlet fever epidemic of 1935-6.

Our current considerations of the Covid-19 pandemic and its impact on children and young people, provide a thought-provoking context to consider the often forgotten history of the long term care of children with infectious disease in fever hospitals, sanatoria, lock hospitals for venereal diseases, and convalescent homes.

In Scotland, over the nineteenth century, there was an increasing focus on the medical care of children and one aspect of this was the development of provision for the treatment of children in hospitals. This included the development of fever hospitals in the latter half of the nineteenth century and the expansion of hospitals, sanatoria and convalescent homes during the first half of the twentieth century. With limited medical treatment for infectious diseases at that time, there was a particular focus on rest, a healthy diet and fresh air.

However, while there was a focus on the medical care of children, there was limited attention to their wider social, emotional and educational needs. Visitors were discouraged and while children may have seen their parents for restricted periods, they were often separated from siblings and other family members for years. Some hospitals had schools, but others provided limited opportunities for education, play or leisure.

Children and young people had widely differing experiences of care and treatment. This may have been to do with the regimes of different hospitals, the impact of different diseases and their treatments, the social stigma of sexually transmitted diseases, or specific historical or medical situations such as the need to respond to epidemics of disease, which stretched existing resources.

This paper addresses the impact of infectious diseases on children in Scotland and details the development of different types of care in hospitals, sanatoria and convalescent homes. It will discuss the specific issues in the development of Lock Hospitals for the treatment of sexually transmitted diseases, where many of the patients were children. It will highlight the variation in children's experiences through first-hand accounts, and explore the extent to which hospitals and other health institutions met the needs of children. Finally, it will show how improved social conditions, housing and sanitation, and advances in medicine and medical practice led to the demise of these types of hospital settings from the 1950s onwards.

This paper cannot claim to address the full range of institutional experiences of children in Scotland of infectious diseases over the eighteenth and nineteenth centuries. In particular, it cannot provide a detailed account of the epidemicity,

morbidity, mortality or therapeutic developments of the different infectious diseases over this time. However, it does record an important aspect of life of children, which, for the most part, has been confined to the past.

While this paper focuses on these issues in relation to Scotland, it reflects wider histories in the UK and internationally.²

Children and Infectious Diseases in the Nineteenth and Twentieth Centuries

Before modern understanding of infection, medicines and sanitation, children were the most vulnerable to disease and illness. Smallpox was “the most terrible of the ministers of death among children” before the nineteenth century, and the vast majority of deaths from smallpox were children.³ Other infectious diseases such as tuberculosis, typhus, whooping cough and measles were also rife.

While a number of Scottish doctors focused on the diseases of children through the eighteenth and nineteenth centuries, Tait highlighted that the second half of the nineteenth century marked the beginning of real focused interest in the health and care of the child in Britain. He identified three doctors who launched “whole-time paediatrics” and introduced “systematic instruction”: Henry Ashby of Manchester, John Thomson of Edinburgh, and George Frederick Still of London.⁴ Medical practitioners in Scotland made a significant contribution to these advances, and by the twentieth century, there was a growing focus on paediatrics and child health.⁵

Despite this, young children continued to be the most vulnerable to death by illness, and, in Scotland, infectious diseases such as smallpox, typhus and cholera were major killers. “Deaths of children under ten accounted for more than half the deaths

in Glasgow in the early 19th century, and even as late as 1861 some 42% of all deaths in the city were in this age group.”⁶ The scale of disease was a result of environmental pollution, poverty and bad housing, and rapid urbanization in Scotland in the nineteenth century had a negative impact on life expectancy and mortality.⁷

In Scotland, in the 1850s, the infant mortality rate was 120 per 1000 live births. It deteriorated over the next period, and in the 1890s, it had risen to 129 per 1000 live births. In the worst areas of Glasgow, it was even more serious, for example, it was 200 per 1000 live births in the Gorbals of Glasgow.⁸

Cullis and Young detailed child deaths in the Royal Hospital for Sick Children, Glasgow in the last decade of the nineteenth century. Almost three-quarters of deaths (73.7 per cent) were due to infection, mostly respiratory diseases and particularly tuberculosis, but also scarlet fever, meningitis or osteomyelitis.⁹ The four most significant causes of death of children in Edinburgh in 1901 were whooping cough, bronchitis and pneumonia, tuberculosis and measles. Scarlet fever, diphtheria, diarrhoea and enteritis also contributed to child deaths.¹⁰

Over the first 70 years of the twentieth century, the infant mortality rate fell steadily, although there was variation across the country. The region with the highest infant mortality rate in 1901 was Lanarkshire, which included Glasgow, with a rate 140 deaths per 1,000 live births. In 1971, the rate was 23 per 1,000 live births. In contrast, Highland had an infant mortality rate of 94 in 1901, and this fell to 15 in 1971.¹¹ While child deaths fell steadily and significantly, severe epidemics of infectious diseases such as scarlet fever, diphtheria, measles, whooping cough and influenza, led to significant spikes in mortality.¹²

The Development of Fever Hospitals, Sanatoria, Convalescent Homes, and Lock Hospitals

The segregation of patients with some types of infectious disease had been an accepted practice for many years. The first leper hospitals, for example, were established in Scotland in the 12th century.¹³ England and Ireland, however, were ahead of Scotland in setting up fever hospitals, and children suffering from infectious diseases were initially treated in general hospitals or the poorhouse.

In the 1840s, temporary fever hospitals or “fever sheds” were set up in Glasgow. Following a typhus epidemic in 1864-65, a temporary fever hospital set up in Parliamentary Road, Glasgow, was made permanent, and “Glasgow thus took the lead in Scotland in providing and binding itself to maintain a permanent fever hospital.”¹⁴

An epidemic of relapsing fever in 1870 led to the need for additional accommodation. Belvidere House and grounds were purchased and initially, temporary wooden buildings were set up as a fever hospital. A separate smallpox hospital was planned at Belvidere and opened in 1877. Over the next ten years, permanent pavilions replaced the wooden buildings of the fever hospital. Russell stated that a large proportion of the patients were children, and detailed the number of cases, including scarlet fever, measles, typhoid, whooping cough, typhus, and diphtheria, with an overall mortality rate of 10 per cent.¹⁵ However, as typhus, typhoid, relapsing fever and smallpox became less common, “the infectious diseases of childhood, particularly cases of scarlet fever, but also measles and whooping cough, were treated,” and the demand for beds grew.¹⁶

Fever hospitals developed in Scotland in the twentieth century, and by the 1920s, “practically every small burgh or district had its own or a combination isolation hospital, and cities with larger populations had established isolation hospitals with a far greater number of beds.”¹⁷ In 1921, Glasgow had 1,637 beds in four hospitals (Ruchill, Belvidere, Shieldhall and Knightswood), Edinburgh had 931 beds in the City Hospital and East Pilton, Aberdeen City Hospital had 214 beds and Dundee King’s Cross Fever Hospital had 196 beds.

Southfield Hospital, in Edinburgh, opened in 1922, as a sanatorium-colony for tuberculosis for patients of all ages, and, in 1930, two new wards for children were opened.¹⁸ Around the same time, Mearns Kirk Hospital, Renfrewshire, was opened by Glasgow Corporation, specifically for children suffering from tuberculosis. The first group of children were transferred from Robroyston Hospital in 1930.¹⁹

In addition to the fever hospitals and sanatoria, a range of children’s convalescent homes was opened. Convalescent homes in the country facilitated recovery from physical illness or injury, and Cronin identified 17 convalescent homes that opened between 1880 and 1939.²⁰ The regime of these country homes was rest, fresh air and a healthy diet.

Some of the major hospitals also opened branches in the country for children to recover from illness or injury. In 1903, for example, the Royal Hospital for Sick Children in Glasgow opened a country branch in Drumchapel, increasing its beds by 25 per cent.²¹ In 1909, the Royal Edinburgh Hospital for Sick Children followed suit and opened the Muirfield Convalescent Home in Gullane for children over two years old, and children would spend two or three weeks convalescing.²²

A particular intersection of girls' experience of infectious disease and social and health intervention concerned sexually transmitted diseases. The lock hospital was a charity for the treatment of female venereal disease patients, and the girls and women were generally considered prostitutes. William Tait reflected the blaming of victims when he wrote, "Many of the girls so affected cannot properly be called prostitutes; but the existence of this disease is very good evidence that they are equally undeserving of the title virtuous."²³

The first lock hospital in Scotland opened in Glasgow in August 1805, the third such hospital in Britain. It continued to operate up until the advent of the National Health Service in the 1940s. In 1882, Patterson provided statistics on patients in the Glasgow Lock Hospital. Of 500 women and girls admitted between 1870 and 1880, the average age was 18 and the youngest was only seven years old.²⁴

The Edinburgh Lock Hospital began to admit patients in 1837, but was not long-lived and closed after only 12 years. Almost two-thirds of the first 1000 patients were aged from fifteen to twenty years old. Forty-two were aged under fifteen years, and the youngest was nine years old.²⁵ The Royal Edinburgh Infirmary, however, had a long history of treating venereal diseases. Other general hospitals and fever hospitals also had lock wards for venereal disease, for example, Aberdeen Royal Infirmary, Glasgow Royal Infirmary, and Ruchill Hospital.²⁶

Debates and conflict about the establishment of Lock Hospitals revolved around issues such as the desirability to cure a disease that was God's punishment for immorality and depravation. The comments of William Tait reflected the taint left by venereal disease, and Davidson wrote that in early twentieth-century Scotland,

victims of child sexual assault “were still viewed as a sexual danger once their “innocence” had been violated.”²⁷ This meant that once the girls and women had been treated in lock hospitals, they were often sent to Magdalene institutions, rescue homes, industrial schools, or children’s homes.

Mahood noted the interdependence of the Glasgow Lock Hospital and the Magdalene Institution. “The Lock Hospital performed the curative function and the Magdalene Institution played the reformatory role and they depended on each other for the exchange of inmates.”²⁸

The Experience of Children and Young People in Hospital

From the nineteenth century through to the 1950s, then, large numbers of children and young people could experience long stays in hospitals and sanatoria because of the impact of infectious diseases. There has been increasing focus on the experiences of children and young people institutionalised in orphanages, children’s homes and residential schools, not least because of their accounts of abuse and neglect, which have been thrown into the spotlight around the globe over recent years. However, there has been much less written about the history of children’s experiences of long-term care in medical hospitals and sanatoria. These hospitals have been increasingly forgotten with improvements in sanitation, housing, vaccination and advances in medical treatments. Research and autobiographical accounts, however, can throw light onto both the common and individual experiences of children and young people, and highlight the range and nature of practices across different hospitals and homes.

This article draws on individual accounts of the experience of children and young people in fever hospitals and sanatoria in Scotland. As well as autobiographical accounts of a number of individuals, McFarlane's study of tuberculosis included the experiences of 30 adults who had been in hospitals and ten of these were aged under 18 when they were in the hospital. They ranged in age from between four and seventeen years old, and spent between 18 months to nine years in five hospitals or sanatoria.²⁹ As is the case with other types of children's institutional care, these accounts highlight a wide range of positive and negative experiences.

Treatments for children in the fever hospitals varied according to the disease and the context, such as epidemics and local resources. Children and young people's experiences were impacted by their treatments, and by the broader regimes of the institutions.

S.C. McEwan recalled that only limited treatment was available when he was in the fever hospital during a scarlet fever epidemic in the 1930s: "Laboratory tests and x ray examinations were never carried out. Ears were cleaned out daily when discharging. Aspirin was given for pain."³⁰ He described how he only underwent necessary surgery at the insistence of his parents who called in their own GP and an external consultant.

In the tuberculosis hospitals, treatment differed according to the type of tuberculosis, as the disease could affect a range of organs in the body, including the lungs, the abdomen, bones and joints, and the brain and nervous system. In the 1940s, meningeal tuberculosis was responsible for over half the deaths from tuberculosis for children under the age of fifteen.³¹

Before the advent of chemotherapy in the late 1940s, “open-air treatment” consisting of good diet, rest and fresh air, was the main intervention for respiratory tuberculosis. This was also a central feature of the children’s convalescent homes set up in the countryside and at the seaside. In 1917, Mackenzie, writing about provision for children who had suffered infectious diseases, and measles and whooping cough in particular, considered that children were “in need of such organised nurture in the open air as only a country convalescent home can provide.”³²

The therapeutic regimes of convalescent homes prioritised a “healthy environment” such as a “warm and sheltered location” with fresh country or sea air. Diet was another important feature of convalescence. Physical exercise and sunshine (heliotherapy) were also regular features of the convalescent homes, and children were taken on regular walks and excursions at a number of the homes.³³

In order to maximize this fresh air treatment, fever hospitals and sanatoria were designed with wide verandas and French windows so that beds could be rolled out during the day. Windows were often kept open day and night, summer and winter, leading to common recollections of children freezing from the cold in winter. “Patients wore woollen hats, gloves, jumpers and bed-socks to combat the Scottish climate.”³⁴ Isabel Gillard, in her memoir of her time in Royal Victoria Hospital for Tuberculosis in the 1950s, wrote, “I am awake in the middle of the night and I am cold. Not ordinary cold. Not shivery. I am frozen to the marrow.”³⁵

Another form of treatment described by Isobel Gillard was the process of resting the lung by introducing air into the pleural cavity, inducing a pneumothorax. This collapse or relaxation therapy was repeated regularly over a period of weeks or

months. Radical thoracic surgery might be carried out if collapse therapy was not successful. One sixteen-year-old patient in McFarlane's study underwent increasingly drastic intervention. Following a period of open-air treatment, she underwent an artificial pneumothorax of her right lung, and later, a thoracoplasty of the left lung, which could involve the removal of ribs to reduce lung volume.³⁶ There was some evidence of pressure for patients to agree to surgery, for example, by denial of qualification for a state allowance for tuberculosis.

For tuberculosis of the bones and joints, treatment involved being kept immobile, and this could include being fastened into a Bradford frame. "The patient was encased in plaster and strapped down by webbing. The frame was on wheels in order that the patient would not be denied the benefits of fresh-air."³⁷ One of the young people in McFarlane's study was in such a frame from the age of eight years to sixteen years old. An eleven-year-old girl, having first been placed in an isolation ward, was strapped to a frame for three years.

The national epidemics of poliomyelitis from 1947, led to large numbers of children being hospitalised in Scotland. A study from 1953 of polio patients in the West of Scotland, including those admitted to the three Glasgow fever hospitals showed that the vast majority were children.³⁸ Ann Carnduff became ill in the polio epidemic of 1948 when she was four years old. She was paralysed down her right side. Initially, she spent five months in hospital. When she was 11 years of age, she returned to hospital to have surgery. "I have two appalling memories from this time in hospital. The first was being paraded in front of medical students wearing nothing but a green loin cloth and, secondly, the severity of the physiotherapy; both were undertaken without my being informed or giving my consent."³⁹ Children could also have to

spend time constrained in an iron lung, or have to undergo repeated surgical operations.

In the lock hospitals and lock wards, mercury was the mainstay of the treatment of syphilis up until the end of the nineteenth century. Although more effective, synthesized treatments were developed in the first decade of the twentieth century, principally salvarsan and neo-salvarsan, mercury continued to be used into the 1940s and 1950s. Although there was some evidence for the efficacy of mercury treatment, its toxicity meant, “it had a very disadvantageous therapeutic ratio.”⁴⁰

There were significant debates about the use of mercury treatment and the variety of treatment methods and doses. This was acknowledged by the Medical Officer of the Glasgow Lock Hospital, Alexander Patterson, who noted that the ‘lavish’ use of mercury caused bone destruction “and that the cure proved worse than the disorder.”⁴¹ In his account of the lock wards of Edinburgh Royal Infirmary, Lees wrote that around 1919, the “female patients received treatment, mainly from a devoted and capable sister, whose good moral influence on the girls was considerable and probably of more value than her medicines.”⁴² Mercury treatments, however, continued to be used extensively.

In 1914, the Matron of the Glasgow Lock Hospital described advances in treatment and nursing, not least the training of nursing staff. In cases of syphilis, girls and women had been treated with mercury, mercurial baths and potassium iodide. With the development of more effective treatments, these were administered to patients, although they were administered mercurial treatments as well. Children in the Lock Hospital were treated in separate wards and the Matron stated that children with gonorrhoea should not be allowed to bathe themselves but that this should be done

by a nurse with her hands protected. Children with syphilis were treated in same way as adults. There was a focus on hygiene because of the belief that transmission of venereal disease could be through “wearing apparel, sitting on chairs, stools, or the floor, baths or lavatories.”⁴³

Extended, invasive and painful treatments for venereal diseases continued into the 1920s and 1930s, despite continuing debate over the treatments and evidence of the damage that some treatments could cause. Davidson argues that this was driven, in part, by the moral imperatives of social reclamation and control of sexual activity. The treatment for venereal diseases were “shaped to a significant extent by the social values and moral imperatives of the medical profession.”⁴⁴

Given the varying effectiveness of treatments for infectious diseases, then, close contact with death was an issue for children in fever hospitals. Death rates varied across hospitals, but death was a constant presence. S.C. McEwan recalled the deaths of children in his ward during the scarlet fever epidemic of 1935-6. “Dead children were removed from their beds or cots each morning and wrapped in a blanket, then taken away on a trolley by the porter. As there were no screens all the children watched and wondered who would be next.”⁴⁵ A ten-year-old boy in Robroyston hospital in the 1940s recalled that only three of the ten patients in his ward section survived. Other children highlighted their awareness of death around them in the fever hospitals and sanatoria.

A contributory factor to deaths of children in hospitals was cross-infection. While there were improvements through the twentieth century, there continued to significant rates of cross-infection in children’s wards at the end of the 1940s,

extending children's stays in hospital and, at times contributing to the death of children.⁴⁶ Fever hospitals also cared for children with gastro-intestinal diseases, and Hinden stressed the higher rates of mortality of children who contracted gastro-enteritis in hospital compared to those who contracted it at home.⁴⁷

Children and young people also described their varying experiences of the regimes of the fever hospitals and sanatoria. Some children had very positive memories of their time in hospital, despite their illness. One 14-year-old girl remembered the patients and staff at Mearns Kirk Hospital as "like one big happy family," and a sixteen-year-old patient described her 18 months in Bellefield as "like a holiday in the country." Another young patient recalled the traumatic experience of returning home to the slums of Glasgow after discharge from Mearns Kirk.⁴⁸

John McBarron described his early years in Mearns Kirk tuberculosis hospital from the age of two until his return home four years later, in 1935. He was in a large dormitory with children of a similar age, and he spoke fondly of the nurses. "These loving people filled my early memories. They also embodied the rules of the house; the proscribed crimes and punishments; "Do's and Don'ts", the rewards and the penalties. All of which would strictly enforced with the highest degree of communal fun and laughter in mind."⁴⁹

The conditions in hospitals during an epidemic were highlighted by S C McEwan. Visitors were not allowed and there were no books or toys. "The beds and cots were so close we could touch each other and there were also beds up the middle of the ward. When they were full, children had to be put two to a bed, one at the top and

one at the bottom, to cope with new admissions. There was no space available for a day room nor for a table and chairs. There was one bathroom for the entire ward.”⁵⁰

Other children and young people highlighted their lack of education in fever hospitals. In 1945, MacDiarmid detailed the limitations created by hospital routine. “In many hospitals it is still almost impossible for the teacher to have a sufficiently clear field for her task since certain medical activities and the daily routine of the nursing staff must go on.”⁵¹ Generally, however, MacDiarmid was positive about the range of developments in hospital schooling. Children’s experiences do not seem to reflect this, and MacFarlane highlighted that the one thing all the children had in common was a lack of formal schooling. Some children received an hour or so of teaching at their bedside and others recalled being taught by adult patients.⁵² Ann Carnduff stressed how craftwork introduced by occupational therapists rescued her from the boredom, isolation and loneliness of the orthopaedic hospital regime.⁵³

Isobel Gillard was struck by the extent to which life in the sanatorium was a process of continued relinquishment. “You gave up a normal daily routine for another that was more regimented and less comfortable, but hopefully restorative.”⁵⁴ Children’s interests could be subsumed to the needs of the institution. Particularly before World War II, “the strict regimentation in the hospitals must, indeed, have made them resemble prisons.”⁵⁵ One sixteen-year-old boy organised a hunger strike in Bridge of Earn Hospital as a protest against the monotony of both the food and the regime.

Although some children spoke positively about their experiences at Mearnskirk Hospital, others were much more critical. One eleven-year-old girl, who was there for five years, thought the regime very strict. An eight-year-old, who spent nine years at

Mearnskirk, thought the discipline was very hard. “He remembers being slapped on the face by a doctor for being cheeky. At the age of sixteen he was sent to the infants’ ward for nine months as a punishment.”⁵⁶

An important aspect of children and young people’s experience was their contact with their family, or, rather, lack of contact. The emotional needs of children in hospital continued to be neglected, siblings were excluded and visiting by parents was restricted; the “hospital view was that visiting upset the children and they were difficult to settle after parents had departed.”⁵⁷ In addition, the fever hospitals and sanatoria tended to be situated out in the countryside, and physically isolated. This often made visiting difficult and one patient in Mearnskirk recalled that his parents had to walk the four miles from Clarkston Toll.⁵⁸

Visiting was also very limited, sometimes just an hour at weekends, and, as children could not visit, siblings may not be seen for years. On leaving Mearnskirk Hospital, John McBarron pointed out that he knew little or nothing about his brothers and sisters, as they had not visited him during his time in hospital.⁵⁹

The worst treatment, however, was experienced by girls and young women suffering from venereal diseases. “Diseased girls were kept in medical isolation, kept apart from their family and friends, and rarely returned. The perception was that once ‘ruined’ they often turned to prostitution, and were therefore contaminated.”⁶⁰ Once they were released from the lock hospital, they were often sent to other institutions.

Gradually, through the 1950s and 1960s, restrictions on visiting were relaxed, influenced by Bowlby’s attachment theory, but “further liberalisation of various approaches to children’s emotional well-being was a gradual process.”⁶¹

The Eradication of Children's Infectious Diseases and the Demise of the Hospitals

“It is a curious reflection that with the overwhelming success of campaigns against so many infections the great infectious diseases hospitals have now outlived their usefulness.”⁶²

In the eighteenth and nineteenth centuries, diseases affecting children began to be addressed through two strands: the development of vaccines and inoculation, and the improvement of hygiene and physical and social environments. Edward Jenner's breakthrough in vaccination against smallpox led the way for the development of vaccines against other diseases. Alongside vaccines, serum therapies were developed for prophylaxis and treatment of a range of infectious diseases. “Diphtheria antitoxin is the remedy most closely identified with the history of serum therapy because of its success in tacking the childhood scourge of diphtheria.”⁶³

Developments in public hygiene such as improvement in water supplies and improved housing began to address the impact of infectious diseases in children. In the twentieth century, medical advances in the discovery of antibiotics and antimicrobials became the third strand in the fight against infectious diseases. It must be acknowledged, however, that the role of different factors in preventing and/or curing the different infectious diseases is complex, and much is still unknown about the interplay of factors in respect of particular diseases.

The introduction of vaccination against smallpox because of Edward Jenner's studies in the 18th century had the potential to have a significant impact on disease and the mortality rates in children. Vaccination provided “the means to prevent the

great morbidity and mortality related to the dreaded smallpox.”⁶⁴ One of the first smallpox vaccination stations in Britain was opened in Glasgow in 1801 by the Royal Faculty of Physicians and Surgeons of Glasgow.

However, vaccination was only adopted slowly in Scotland, as there was a varied response to the use of inoculation dependent on smallpox mortality, access to free inoculation and religious beliefs.⁶⁵ Compulsory vaccination ended in 1948, routine vaccination was withdrawn in 1971 because of lessening risk, and smallpox was eventually eradicated worldwide.⁶⁶

Vaccines for other diseases were developed over following years. Typhoid, cholera and the plague at the end of the nineteenth century. Tuberculosis, whooping cough, diphtheria, tetanus, yellow fever and influenza in the 1920s and 1930s. Polio, measles, mumps and rubella in the 1950s and 1960s, and with further vaccines continuing to be developed into the twenty-first century.⁶⁷ However, the availability of vaccines did not mean that the national population of children were immediately vaccinated, and it could be some years after the discovery of vaccines before vaccination of children was carried out on a national scale.⁶⁸ This, of course, has most recently been seen in relation to the debates around children’s vaccination against Covid-19.

From the 1930s, the maternity and child welfare service in Scotland became increasingly involved in immunisation procedures. With the advent of the National Health Service in 1948, this was increasingly shared with general practitioners.⁶⁹

Historical developments have led to an extensive immunisation programme in Scotland. From eight-weeks-old, the six-in-one vaccine protects against diphtheria,

tetanus, whooping cough, polio, haemophilus influenza type b and hepatitis B, and separate vaccines protect against rotavirus and meningitis B. From 12-weeks-old, babies can be protected against pneumococcal disease. Between 12 months and 13 months, the MMR vaccine protecting against measles, mumps and rubella is available, and from age two, children can be protected against influenza. Further boosters and protection are offered to children, as they get older.⁷⁰ Thus, there is a comprehensive vaccination programme to protect children against the major infectious diseases, which caused so much death and illness in the past.

The second strand in the fight against infectious diseases addressed poor living conditions, sanitation and public hygiene. Improvements in water supplies in the mid-nineteenth century began to address child mortality from cholera and other diseases. For example, investment in a new water supply for Glasgow in the 1850s, bringing water from Loch Katrine into the city and, thereby, practically eradicated cholera from the city.⁷¹ There was a direct link between death rates and the proportion of houses without piped water supplies. Infant mortality rates fell significantly before 1900 and it “is probably safe to conclude that their decline was a result of sanitation improvements which reduced the incidence of water-borne and diarrhoeal diseases.”⁷²

In the nineteenth century, slum clearance was undertaken to address the worst conditions of overcrowding and below standard housing. There was an increasing realization, however, that not only was there a need to clear slums but to provide suitable and affordable housing for those who were decanted from the slums.⁷³

Reductions in the size of families also contributed to a decrease in overcrowding and reduction in infections.⁷⁴ Overcrowding and poor housing conditions continued,

however, to have a significant impact on infant mortality. This was particularly the case in Glasgow, and even by 1951, almost half of its population lived in houses of two or less rooms, much worse than the major English cities.⁷⁵ This led to Glasgow having the highest rate of infant mortality in Britain, and “Glasgow’s single-ends were death traps, and as long as they existed, medical advances were unable to provide further reductions in infant mortality rates.”⁷⁶

At the turn of the twentieth century, based on developments in Europe to address epidemic diarrhoea, there was an increased emphasis on the health of newborn babies, focused on medical supervision, encouragement of breast-feeding, and provision of sterilised cow’s milk. In 1903 and 1904, milk depots were established in Edinburgh, Dundee and Glasgow, and these provided clean, affordable milk and courses on infant hygiene.⁷⁷ The loss of life in World War I, and the need for large numbers of women to work, led to a focus on child and maternal health services, and legislation was passed which empowered local authorities to provide for the health needs of expectant and nursing mothers and children under five.

The third strand in the fight of infectious diseases was the development of antibiotics, which could cure children who fell ill. Following early discoveries of the antiseptic effects of moulds on wounds, the first antibiotics and antimicrobials were developed at the start of the twentieth century. In 1909, Paul Ehrlich discovered that the synthetic compound arsphenamine, or Salvarsan, was effective against syphilis. In the 1930s, sulfanilamide was found to be effective against bacteria such as *streptococcus*.

In 1929, Alexander Fleming rediscovered the antibacterial properties of penicillin, although it was some ten years before scientists at the University of Oxford identified its significance, and this finally led to the large-scale production of penicillin in the United States.⁷⁸ From these early developments, new antibiotics were discovered and synthesised, and “the 1950s and 1970s was indeed the golden era of discovery of novel antibiotics classes, with no new classes discovered since then.”⁷⁹

The development of antibiotics meant that there was increasingly effective therapy for the range of bacterial infections that affected children, such as tuberculosis, scarlet fever, whooping cough, diphtheria and meningitis. However, developments were not straightforward and, in some cases, antibiotics could have negative consequences. Further, antibiotic resistance and the advent of multidrug resistance poses a global health challenge and antibiotic resistant infections are increasing in children.⁸⁰

The success of these three strands in the battle against infectious diseases led, then, to the closure or re-designation of children’s hospitals, sanatoria and children’s convalescent homes. Mearns Kirk Hospital, for example, closed as a children’s hospital in 1959 and became a general hospital before its final closure in the 1990s. Similarly, Belvidere Infectious Diseases Hospital became a general geriatric hospital before it closed in 1999.

Conclusion

Infectious diseases were a significant cause of death in infants and children in Scotland until the early decades of the twentieth century. Smallpox, tuberculosis, typhus, whooping cough, cholera and measles were rife in the nineteenth century,

and epidemics continued to be a regular occurrence into the twentieth century.

Without effective treatments, infant and child mortality rates were high.

Initially, general hospitals and poorhouses dealt with infectious diseases. However, in the mid-nineteenth century, fever hospitals, sanatoria and convalescent homes began to be developed to provide care and treatment, and a significant proportion of patients were infants and children. Sexually transmitted diseases led to girls being isolated in lock hospitals, where treatment had moral overtones, and innocent victims were stigmatised. These institutions continued to be a major element in the treatment of infectious diseases in children into the second half of the twentieth century.

While there were ongoing developments in preventing these diseases through vaccination and improved sanitation, significant numbers of children were hospitalised, sometimes for extensive periods. Treatment itself could be painful, restrictive and often ineffective, and some children were in hospital for many years.

Children's experiences of fever hospitals and sanatoria were varied. Some had very happy memories of their time in hospital; while some had difficult memories of the deaths of children. Others found the regimes of hospitals harsh and rigid. Children's parents could visit but this was limited and restricted, and children might not see their brothers and sisters for years. Education was also limited and many children did not have any formal teaching while they were in hospital.

Infectious diseases in infants and children were addressed in three main ways.

Vaccination for diseases were developed and a regular schedule of vaccination was put in place. Effective antibiotics and antimicrobials were developed, and these

marked a major advance in the cure of infectious diseases. Finally, improvements in sanitation, housing and child nutrition made a significant difference in the prevention of infectious diseases. These advances meant that children were no longer at the same risk of infection, and hospitals, sanatoria and convalescent homes closed in Scotland through the second half of the twentieth century.

While times have changed, global death rates of infants and children from infectious diseases highlight the continuing impact of poverty and inequality and the need for this to be addressed. In 2018, almost a third of deaths of children under five were caused by pneumonia, diarrhoea and malaria

The Covid-19 pandemic is a reminder that new infectious diseases are a constant threat, and highlights the necessity of being prepared to ensure the health and safety of our children. Fortunately, the direct impact of Covid-19 infection on children and young people itself has tended to be mild or asymptomatic, with few recorded deaths. However, the broader emotional and well-being impacts upon children and young people are significant.

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