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**Special issue:** ***Historical narratives of public health in the built environment***

**Research article**

# Disease and design in twentieth-century South Africa: exploring the consequences of the 1918–19 Spanish Flu pandemic through contributions of émigré Dutch architects

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## Abstract

The architectural history of healthcare in South Africa remains greatly understudied, as do the consequences of the 1918–19 Spanish Flu, which ravaged its population. Yet that pandemic had great consequences for South African society, spatial planning and the development of healthcare, of which the latter two were still in their infancy at the time. This article explores the link between disease and design in South Africa through the presentation of the histories of selected hospitals, maternity homes, orphanages and a special care school designed by émigré Dutch architects from the 1920s to the 1970s. It is the product of desktop and archival research, site visits and interviews undertaken in

both South Africa and the Netherlands. It outlines the disparity of care that was provided for different groups and is a first attempt to identify healthcare ideas transposed into the subcontinent fuelled by the tragic experiences of the Spanish Flu pandemic. Due to this health crisis, communities – structured in terms of language, faith and race – attempted to develop their own facilities for the care of their own. Where communities had no means of their own, charitable organisations tried to fill the void. Over the course of the twentieth century, public healthcare was centralised, but many of the community and charitable institutions persist. By chance or choice, émigré Dutch architects made a disproportionately large contribution to the development of healthcare facilities in South Africa, not only in the number and range of facilities they designed, but also by introducing contemporary ideas into South African healthcare design.

**Keywords:** Spanish Flu; South Africa; healthcare design; Dutch émigré architects; segregation

## Introduction

During the twentieth century, the design and construction of architecture in South Africa closely followed Western trends. A recent publication, *Common Ground: Dutch–South African architectural exchanges 1902–1961*,[1] highlights conclusions of research into the legacy of émigré Dutch professionals in the built environment of South Africa today. A surprising discovery of the above research, undertaken by the University of Pretoria, was the critical role that Dutch-educated architects played in the design of healthcare facilities. This built healthcare legacy has proven to be especially resilient to change: the hospitals, clinics, childcare facilities and institutions often still serve the communities they were designed for.

The current Covid-19 pandemic gave cause to further investigate the development of care facilities in South Africa, specifically in the aftermath of the Great or Spanish Flu pandemic of 1918–19 and the consequences thereof for the built environment, a topic which has surprisingly received little attention in built environment histories. This article explores how Spanish Flu stimulated healthcare development in South Africa, leading to often locally novel implementation of new insights in healthcare design during the early twentieth century.

## Methods

This article builds on the four-year Tectonic ZA Wilhelmiens[2] research project undertaken at the Department of Architecture of the University of Pretoria to deliver *Common Ground*. In this process, an inventory of projects was created. Its information sources include private and public archival searches in South Africa and the Netherlands, desktop reviews, interviews and site visits by the author and other researchers who collaborated in the project. The online database Artefacts[3] provided an important resource to locate the researched and discussed projects within the South African architectural chronology. The examples presented in this article were selected from the inventory of projects discovered for their representation of the introduction and persistence of healthcare ideas through the agency of migration.

## Epidemics and the Spanish Flu pandemic in built South Africa

Globally, the late nineteenth and early twentieth centuries were punctuated by epidemics, including of bubonic plague and cholera.[4] South Africa was no exception. Epidemics and pandemics were demonstrably highly influential in shaping its built environment during the early twentieth century. The rinderpest of the 1890s, considered to be the most devastating epidemic to hit Southern Africa in the late nineteenth century, decimated the cattle populations of the subcontinent. Its dramatic economic


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consequences for rural communities stimulated urbanisation.[5] Other epidemics hit these urban centres. Between 1895 and 1950, for instance, no fewer than six epidemics ravaged South Africa's biggest city, Johannesburg.[6]

These localised epidemics disproportionately affected the poor and marginalised, giving the wealthy a false sense of security and increasing distrust of the 'dirty' poor. In a city like Johannesburg, the Black population bore the brunt of these many health crises. In an increasingly White minority-dominated, racially segregated South Africa, 'hygiene' was often given as motivation for the forced relocation of Black South Africans from their homes in cities to new towns. For instance, when in 1904, 48 cases of bubonic plague were recorded in the mixed-race shantytown of Brickfields, this gave cause for its raising by fire by the city's own fire brigade, with its residents carted off, away from the city, to a 'health camp' at a place called Klipspruit, some 20 kilometres from the city centre.[7] This health camp was the nucleus of a new 'township', later called Soweto. Townships were located away from White settlements and usually beyond a defined territory that functioned as a sanitary zone (Figure 1). They were provided with basic amenities, including clinics and hospitals, by an increasingly racist and supremacist regime, arguing that the provision of basic needs was equal to the provision of human dignity. The hygienist argument for forced removals is well described in the literature dealing with spatial planning, policy and housing in apartheid South Africa.[8]

**Figure 1. Atteridgeville satellite township, built to house Black inhabitants removed from Pretoria's suburbs, *c.* 1945 (Source: University of Pretoria Special Collections)**



Bubonic plague was seen as a disease associated with filth and squalor,[9] but the Spanish Flu did not discriminate in this manner. On 14 September 1918 an article in the Johannesburg newspaper *The Star* reported that Johannesburg was reasonably safe from the flu that was ravaging war-torn Europe.[10] Even when 11 days later the same newspaper reported 14,000 cases of the flu in the city, doctors still maintained that matters were under control. The city was only shaken up once it became clear that this was not only a disease of the poor and miners, when, for instance, the movie-house mogul I.W.


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Schlesinger collapsed in public in broad daylight and had to be removed to the city's Carlton Hotel for treatment.[11]

This pandemic struck an already drought-ravaged South Africa hard. Within seven weeks, roughly 250,000 people died (of a population of about 6 million). Previous epidemics had already highlighted the need for improved sanitary conditions.[12] Steps had been taken towards the provision of public healthcare facilities, specifically the construction of new hospitals in major cities following the unification of South Africa and the creation of a national Public Works Department in 1910.[13] The Spanish Flu was, however, of such a scale that the entire country was affected; its healthcare system incapable of coping.[14] The lack of nurses and nursing skill was especially problematic. It was generally accepted that 'more people died from lack of nursing than from lack of medicine'.[15]

Surprisingly, general urban historiography is all but mute on this near calamitous event. A city biography of Johannesburg published in 1929 devotes only one paragraph to the Spanish Flu, noting death figures, and that 'thanks to the health precautions taken on the Witwatersrand, Johannesburg suffered somewhat less than most places.'[16]

The government was forced to recognise its responsibility for social welfare, even if then it did so only for its White citizens. The country's first Public Health Act (1919), adopted in the wake of the pandemic, led to the creation of an autonomous Department of Public Health. This Act initiated a public health system that has since commissioned the design and construction of public health facilities for more than a century.

The country's first Housing Act (1920) introduced hygiene provisions, such as rules to prevent over-crowding,[17] that were directly informed by the conclusions of the 1919 national Influenza Epidemic Commission.[18] This Act was to have a great influence on the South African built environment. Yet architectural historiography is similarly silent about the Spanish Flu as a contributing factor when investigating the development of the South African built environment.[19]

The government's inadequate response to the pandemic also stimulated community initiative, which in turn stimulated innovation. The early 1920s brought the establishment of many community initiatives to address their own urgent health needs.

## Sunny, salubrious care environments

### The Zuid-Afrikaans Hospital, Pretoria

The Spanish Flu served as a clarion call to improve not only health and hygiene, but also public healthcare facilities and the training of lay and professional healthcare givers, initiating a half-century of community-driven healthcare development. With vaccines and antibiotics still to be developed, good building design was deemed essential to maintain health.[20]

Healthcare in Southern Africa had to date been small-scale and home-based, with a few hospitals constructed in larger cities. In Cape Town, the Synod of the Nederduits Gereformeerde Church appointed a commission in 1919 to establish the church-operated Volkshospitaal (people's hospital) to cater to the city's Afrikaans community as a direct response to the Spanish Flu.[21] A bespoke hospital building was only realised in 1928 to the design of Architectural Association-trained architect Wynand Louw.

Pretoria's small Dutch emigrant community had already established its own six-bed hospital, the so-called Diaconesse Ziekenhuis (today the Zuid-Afrikaans Hospital, ZAH) in an existing house, following the South African War of 1899–1902. The ZAH was established to provide its own mother tongue-based healthcare. The hospital was closely aligned to a similarly named hospital in Utrecht in the Netherlands, founded in 1844 and serviced by deaconesses (Protestant nurses) as a charitable act. The reputation for personal and professional care earned by the Utrecht-trained Dutch deaconesses in Pretoria during the Spanish Flu pandemic was such that a new, larger, state-of-the-art hospital building was urgently needed.

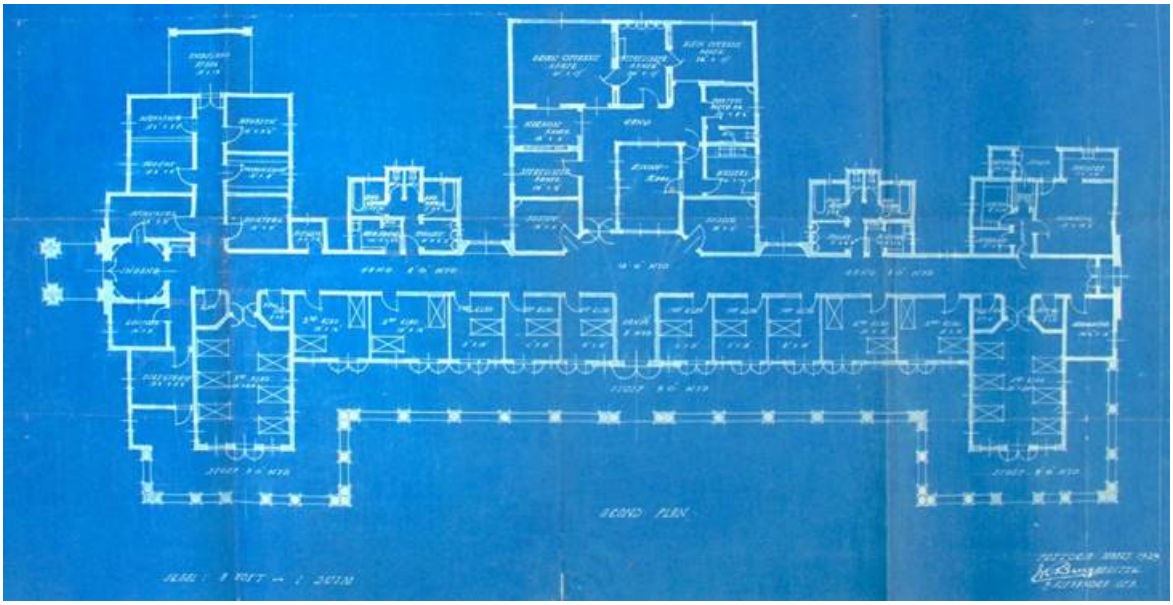
The hospital now also aimed to train its own nurses, specifically to address the need for mother tongue-based care for the Afrikaans community. However, under the new Public Health Act, a hospital had to have at least 40 beds to serve as a training facility.[22] A new facility was needed and was possible due to new municipal subsidies and donations from the Netherlands.

The choice of site and the design of the hospital was locally innovative, especially in the way that access to sunlight and a salubrious environment were seen to be as important as achieving an efficient and hygienic environment. The site is located on a northern slope in a position to maximise access to


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sunlight. The hospital's design, awarded to Dutch émigré architect Johan R. Burg (1874–1960), includes a continuous veranda along the front of the building (Figure 2). Efficiency and a focus on individual care were key considerations for the project. The large general ward had fallen out of favour internationally due to the risk of contagion highlighted by the flu.[23] Its six-bed wards and private rooms all had access to the veranda with views over an extensive garden and the valley below.

**Figure 2. Floor plan of Johan R. Burg's first design for the Zuid Afrikaans Hospital in Pretoria, 1929, with veranda to the north (Source: Hanrath Collection, Het Nieuwe Instituut, Rotterdam, HANR0406, t722-t730)**



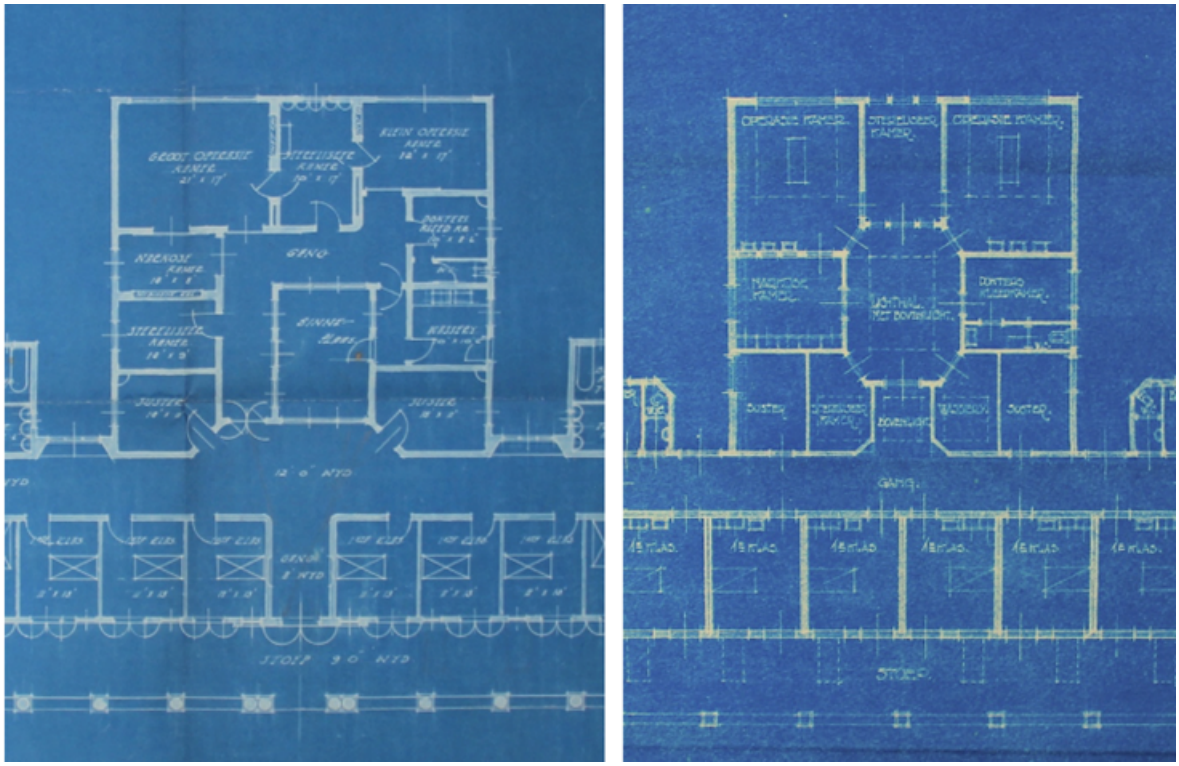
The high-ceilinged wards allowed for plentiful ventilation and were, unusually for a general hospital, designed in such a manner that patients could be wheeled onto the veranda. This was, however, common for the treatment of tuberculosis patients following the remarkable reports of the success of heliotherapy (beneficial exposure to the sun's rays) achieved by physician Auguste Rollier (1874–1954) in his Swiss clinics. Rollier advocated fresh air, exercise, plentiful rest and sunshine as a cure for tuberculosis and reported his successes in his own publications *La Cure de* Soleil (1914) and Heliotherapy (1923).[24] These ideas not only led to the establishment of sanitaria throughout the world,[25] but also notably influenced architect Johan W. Hanrath (1867–1932) in his design for the Utrecht Diaconesse Hospital (foundation stone laid in 1926), which included a large garden.

Due to the close ties between the ZAH and the Utrecht Diaconesse hospital, Burg's proposal was sent to the Netherlands to be scrutinised by Hanrath. Hanrath's contribution to Burg's design focused on the efficiency of the operating ward located on the cool southern side of the main building volume, reconfiguring it to remove the need for a courtyard and corridor and extending the area of south-facing top lights (Figure 3). He tweaked the size and proportions of the wards and rooms based on his recent experiences. He also advised to deepen the veranda and designate spaces allocated to specific beds thereon, possibly to avoid cross-contamination.[26]

Continued exchanges addressed the selection of flooring, window and door frames, acoustics and furnishings. Hanrath's office also served as a go-between between Burg and the Dutch building component and medical equipment manufacturers, forwarding to South Africa brochures on lighting and X-ray equipment from companies such as Philips, among others.


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**Figure 3. Johan R. Burg's plan of an operating theatre wing for the Zuid Afrikaans Hospital (left), improved by Johan Hanrath (right). Translation: *Operasie kamer:* Operations Theatre; *Narkose kamer*: Anaesthetics room; *Binne-plein*: Courtyard; *Lichthal met bovenlicht*: Light well with top light (Source: Hanrath Collection, Het Nieuwe Instituut, Rotterdam, HANR0406, t722-t730)**



## Maternity homes

The ZAH's ambition to train their own nurses was mirrored by the Suid-Afrikaanse Vrouwevereeniging (South African Women's Association, SAVV). In 1918 the SAVV founded their own maternity home, the Moedersbond, to train midwife and mothercraft students specifically for rural areas.[27] In 1928 they commissioned Burg to design a new maternity home-cum-training facility in Pretoria, so that they could double their training capacity. Located on a large plot of land with a view westward over the town, the complex included both a maternity hospital with single-, double-, four-bed and eight-bed rooms catering for patients with different budgets, and accommodation for the nurses and trainees. Burg's design (Figure 4) is innovative in the way he ensured that all patient rooms and wards have access to either east- or north-facing balconies (unlike the sisters' which have none). As for the ZAH, the success of Rollier's heliotherapy for tuberculosis patients was not only combined with insights into the antibacterial effect of sunlight on surfaces, but also aimed at supporting the wellbeing of mothers and babies by providing a salubrious environment. The maternity home was completed in 1931 (Figure 5).

In Cape Town, a similar initiative led to the creation of the Leeuwendal Maternity Home (Figure 5).[28] Its new 1939 maternity hospital was designed by Dutch émigré architect H.T.O. Niegeman of the firm Andrews & Niegeman. Niegeman was a member of the progressive Dutch architectural collective De 8 and a protagonist of the modern movement.[29] His stark modern design for the maternity home, situated with a northern exposure, may be stylistically different from Burg's Art Deco design, but it follows many of the same principles: the building was provided with a continuous balcony for sunlight, views and ventilation. Both buildings aimed to create a salubrious environment and present these community initiatives as progressive, world-class institutions. The themes of sunlight and access to fresh air through verandas was to become standard practice for South African maternity hospitals for many years, epitomised by G.E.G. Leith's (1886–1965) Queen Victoria Maternity Hospital in Johannesburg (foundation stone laid in 1943).[30]


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**Figure 4. Annotated floor plan of the Moedersbond Maternity Home. Note the arrow pointing north arrow in the bottom right corner (Source: Architecture Archive, University of Pretoria, John Cleland Collection)**

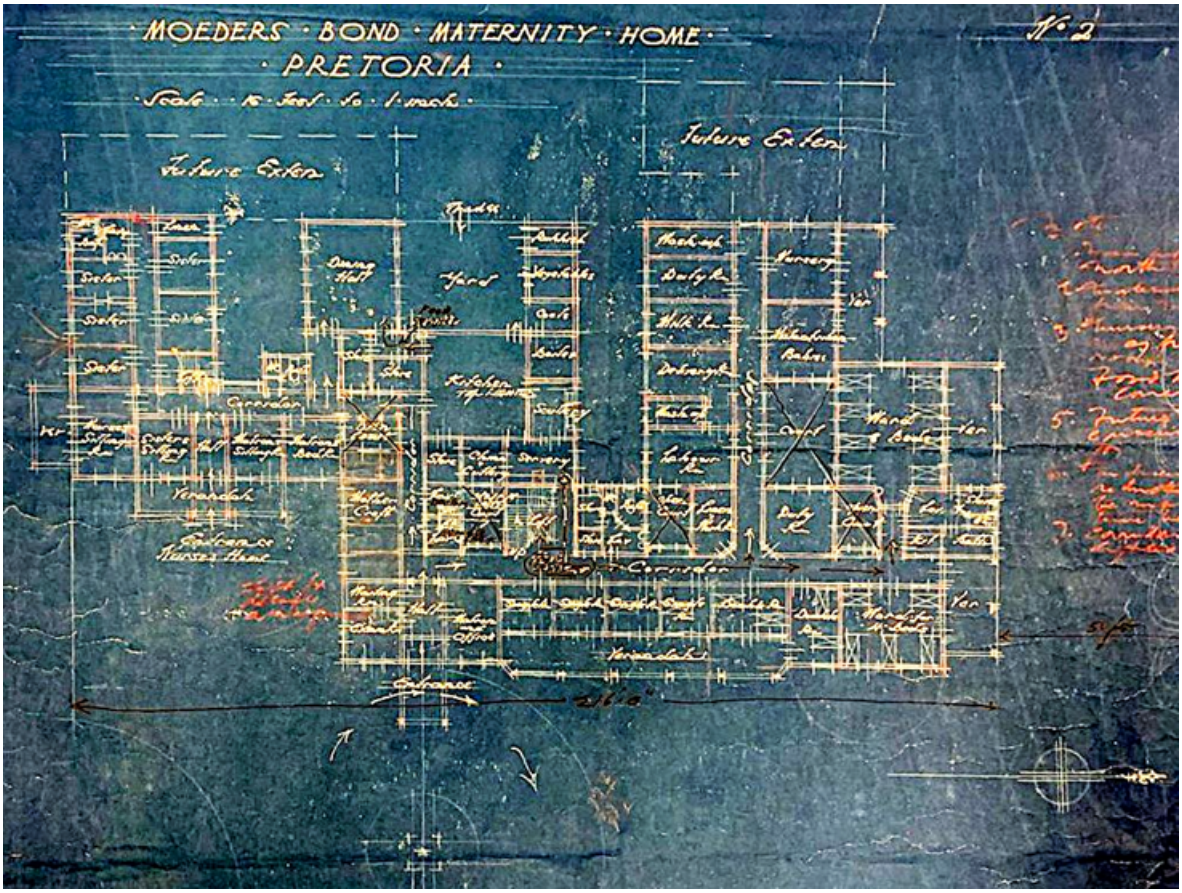



**Figure 5. Two maternity homes developed by community organisations: the Moedersbond in Pretoria (left) and the Leeuwendal Maternity Home in Cape Town (right). The former is now used as a training institute for ambulance personnel, while the latter has been demolished (Source: author (left); Van Graan, 2011 (right))**






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## Faith-based child formation

The World Health Organization defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'.[31] Designing and building for healthcare therefore extends beyond hospitals and encompasses a range of built environment scales from the urban to the detail, and effectively all building types used by people.

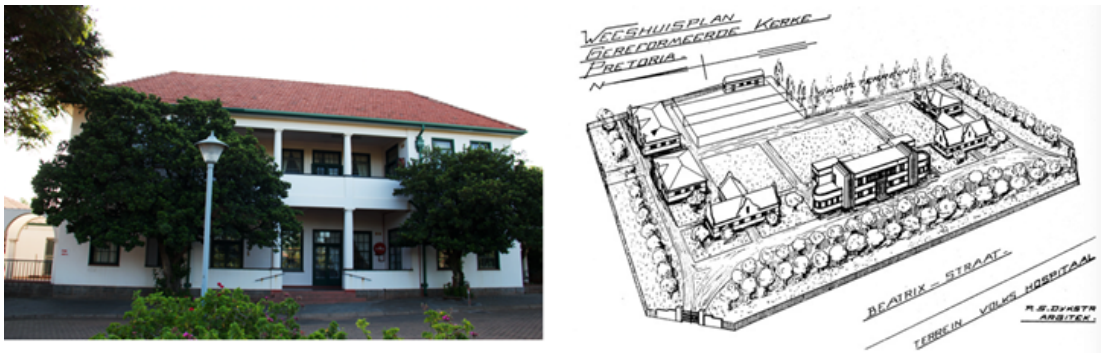
The 1918 Spanish Flu pandemic not only highlighted the limited healthcare available in the public system; it also produced a new problem: thousands of flu orphans and widows.[32] The government established subsidies to assist existing orphanages in increasing their capacity, but Afrikaner communities were anxious that orphans of Afrikaner parents would be raised in institutions that did not foster in them the identity and mores of their deceased parents, or would deliver them into semi-servitude. In particular, the 'threat' posed by Catholic and English (read 'imperialist' from the Afrikaner perspective) institutions galvanised those communities to establish their 'own' charitable institutions, often aligned with one of the three Afrikaner Protestant churches: the Nederduits Gereformeerde (Dutch Reformed), Gereformeerde (Reformed) and Nederduits Hervormde (confusingly, also Reformed) churches.

### Rural idyll

The Louis Botha Memorial Home for Children in Pretoria was founded as an independent non-aligned institution in 1918 to accommodate children orphaned by the Spanish Flu. The architects, Dutch émigré duo De Zwaan & Soff's proposal (Figure 6), completed in 1923, was traditional in its conception; it provided all facilities, including communal girls' and boys' dorms, under one roof.

Other institutions were aligned with one of the three Afrikaner Protestant Church groupings. Funding its own children's home was a challenge for the small conservative Gereformeerde Church. The church initially elected to place orphans with families among its own, or with institutions aligned with the larger Nederduits Gereformeerde Church.[33] But by the early 1930s it was in a position to commission Dutch émigré architect P. S. Dijkstra (1884–1968) to develop a design for its own orphanage, later called the President Kruger Children's Home. His design was for a main building with disconnected pavilions to resemble farmhouses. The main building, in a streamlined Art Deco style, presented the institution as contemporary and modern (Figure 6). The styling of the annexes in Cape Dutch Revival, not only expressed the institutions' cultural alignment with Afrikanerdom; it also expressed a rural/agricultural idyll: the Gereformeerde Church's ideal for the formation of a child's character. Each 'house' was positioned to have its own street front; each formed a standalone home. Financial difficulties brought by the Great Depression delayed its construction and only the main building was completed in 1939. The Nederduits Hervormde Church likewise established its own children's homes in Krugersdorp (1923) and later Pretoria where orphans were allocated to 'families' with a 'mother' and 'father'.[34] The introduction of the idea to recreate independent family units was novel and introduced the family-based orphanage model that has become the standard for orphanage design in South Africa.

**Figure 6. The former Louis Botha children's home and the design for the President Kruger Children's Home, both in Pretoria (Source: author (left); *Gereformeerde Kerk Almanak*, 1934, public domain (right))**





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## A scientific approach

At the Cape, Niegeman was commissioned to design a boarding school and care facility for children who suffered from epilepsy. This idea for a special school came from the wife of a Nederduits Gereformeerde preacher, after their son died from an epileptic fit. It was named the Jan Kriel Institute in his honour. A new complex could be commissioned after the Nederduits Gereformeerde Church agreed to take the institute under its wing, allowing it to raise funds among its many congregations.

The design Niegeman developed is replete with modernist idealism aligned with the Dutch equivalent of the modern movement, Het Nieuwe Bouwen, which aspired to rationalism and hygiene, utilising modern construction methods and materials to achieve an aesthetic result. The design, which especially recalls Sanatorium Zonnestraal (1928–31) in the Netherlands, epitomised the light, air and space ideals (Figure 7). Niegeman projected a complex of individual pavilions with separate girls' and boys' dormitories. All meals were to be taken in a communal dining hall, located away from the dormitories, ensuring that all children got their daily dose of fresh air, come rain, wind or shine. This project was designed for daylight, efficiency and hygiene, devoid of romanticism or illusions of homeliness. The school still functions and caters for students with an ever-widening range of special needs.

**Figure 7. The Jan Kriel Institute, Kuils River, exterior and view of a dormitory shortly after completion; exterior and interior views of the disused dining hall in 2020 (Source: Niegeman Collection, University of Cape Town (top left and right); author (bottom left and right))**



## The health factory

Following the Second World War, the South African government slowly but surely established healthcare as a public matter. The Department of Public Health, founded in the wake of the Spanish Flu pandemic, and provincial departments of health commissioned more and larger facilities, expanding their services to an ever more segregated society. Provincial hospitals were expanded and training hospitals were constructed. Under a growing apartheid policy, these largely served the country's White population, or extensions were commissioned in service of further segregation. In Port Elizabeth, the firm of Siemerink


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and Brinkman – a partnership between Dutch émigré architect Hendrik Siemerink and his daughter Gertruida Brinkman – was commissioned to extend the Provincial Hospital that Siemerink had designed as a general hospital in 1915, with wards specifically reserved for so-called 'coloured' patients (1937), precluding the Reservation of Separate Amenities Act (1953) that mandated that no facilities may be shared between Blacks and Whites. Modernism, modernisation and continuously increasing state control went hand in hand.

Over the course of the twentieth century, the ideal of efficient systems operations in hospitals grew in preference over a holistic approach to hospital design internationally.[35] The ideal of a highly efficient hospital was expressed by American hospital architect Arthur Peabody (1858–1942) in 1921 as:

> one could imagine a well arranged [hospital] plan whereby patients would enter, in a continuous stream to the sorting room, thence to the divesting room, the bath, the anesthetizing room, the cutting off room, the assembling room, the finishing room, the seasoning room, and finally to the shipping platform, from which they would be sent to all parts of the world.[36]

Efficiency was of course already evident in the design of the ZAH, and especially pronounced in the comment on Burg's plans by Dutch architect Hanrath. Brinkman's 1953–5 Livingstone Hospital (1953; Figure 8) applied the principles of fresh air, daylight and efficiency, with a continuous deep balcony facing the sun on each of the five storeys of the 'White' wards.

**Figure 8. The main ward of the Livingstone Hospital, East London (Source: B. Brinkman, with permission)**



The ideals of efficiency found their most lucid expression in South African hospital design in the Tygerberg Hospital (Figure 9). Andrews & Niegeman won the commission for this new academic hospital for the University of Stellenbosch, outside Cape Town. The gargantuan hospital complex was commissioned in 1956 and completed two decades later. Niegeman took the lead in designing the complex. In his earlier career he had designed factories in Yaroslavl, Lublinov, Grosny and Moscow, Russia, for the Soviet Building Trust.[37] His most famous project, the Rex Trueform clothing factory in Cape Town (1939), is a textbook example of a vertical daylight factory: an American factory model that optimises daylight on the factory floor through a combination of a narrow floor plate and large glazed façades.[38]


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**Figure 9. The north façade of the main block of the Tygerberg Hospital, Cape Town (Source: François Swanepoel, 2021, with permission)**



As part of his Tygerberg commission, Niegeman was sponsored to tour the USA, Canada, the UK and Europe to study 'the important hospitals in the USA, Canada, Britain and the continent'[39] for advances in hospital design. The intricate programme for this large hospital complex demanded that it be based on the design and separation of flows in the systems that would serve it, starting from vehicular access to the cycles of linen from the laundry to the stores, to the wards and back again. The hospital building was notably conceptualised following the Breitfuss (broad foot) model, where the inpatient wards are located in a tower (or towers), placed on top of a broad slab containing the so called 'hot-floor' (for example, operating rooms, emergency room or outpatients) – an American model first adopted on mainland Europe for the Hôpital Franco-American in Saint-Lô, completed in 1954.[40] Ambulances deposit patients via an aerial causeway from the south, and visitors enter via lobbies on the north. The programme was compounded by the decidedly inefficient provisions of the 1953 Reservation of Separate Amenities Act, which mandated two racially separate hospitals. This led the project team to duplicate the programme.

All facilities in the complex were designed to the same standards and finishings. Only the number of beds were adjusted proportionally to the demographic served.[41] The accommodation programme was simply extended by adding more floors; all bedrooms/wards facing north; their windows carefully designed to control solar access over the seasons.[42] In keeping with post-war thinking on environmental psychology and patient health,[43] colour was applied abundantly – even in the operating theatres – following Wilhelm Ostwald's colour theory.[44] Public areas were enlivened with integrated works of art. The interior was completely sealed off from the outside and conditioned to ensure optimal environmental control, the ideals of a salubrious healthcare environment with access to light, air and nature being sacrificed to achieve efficiency and mechanical control.

## Concluding remarks: the persistence of a legacy

The early modern history of South Africa – its urban planning but also its healthcare – was shaped by a succession of epidemics. The legacy of the Spanish Flu pandemic in South Africa has to date not been generally acknowledged in South African architectural history, yet its consequences were not insignificant. It not only accelerated the adoption of spatial and healthcare legislation and the development of public healthcare and housing provision; it also stimulated existing community-based healthcare to develop further and encouraged the establishment of new private institutions among those communities with sufficient economic agency.


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The dramatic societal impacts of the Spanish Flu pandemic galvanised communities, including the culturally aligned Dutch and Afrikaner, to create their own institutions for primary and secondary healthcare.

Their early contribution was to introduce innovations focused on creating patient-centred salubrious environments, through natural ventilation, access to light, the outdoors and sunlight. These were later superseded by the idea of the efficient health factory from North America, the first South African example of which was designed by an émigré architect associated with the early Dutch modern movement.

The Spanish Flu and other healthcare crises furthered the segregation of society into classes structured along racial lines, which were then provided for in an unequal manner. Empowered communities looked to themselves and their international networks to establish their own charitable institutions while those disempowered through colonialism were left to rely on charitable healthcare provision. These charitable institutions were often associated with religious and missionary activities. Here, too, Dutch émigré architects made a significant contribution, again introducing novel ideas, or responding with pragmatism to limited resources.

Prestigious projects were not only conceptualised as infrastructure in service of the community: they were symbols of modernity or of ideology. All the healthcare facilities discussed in this article express the ambitions of their commissioning institutions.

The limitations of this article are twofold: its narrow focus on transmission via Dutch émigré architects excludes other vectors and their contributions; and it focuses mainly, but not exclusively, on the provision of healthcare by communities with economic and political agency: its White population. A definitive study of the history of healthcare institution design in South Africa remains to be undertaken, despite the great merit of the subject. If executed, such a study would provide numerous new insights that are relevant today for a number of reasons, including for the design of new healthcare facilities.

The Spanish Flu stimulated the cross-continental exchange of new insights in healthcare, in turn moulded Southern Africa's healthcare landscape which directly affected the lives of its inhabitants. Dutch-educated architects were vectors of new insights, which remain visible in the healthcare facilities that they designed, due to their transcontinental origins and associations with specific communities.

In the same way, and despite the central role governments took in the global response to the Covid-19 pandemic, it can be expected that the consequences of the current pandemic may have lasting consequences for healthcare design, financing and provisioning in the longer term.

## Notes

[1]Clarke, Fisher and Kuipers, eds., *Common Ground*.
[2]Part-funded through the Dutch Embassy in Pretoria's International Heritage programme.
[3]'Artefacts.co.za'. Accessed 15 October 2022.
[4]Le Huec et al. 'Epidemics over the centuries'. Five 'cholera' waves emerged globally over the course of the nineteenth century. Evans, 'Epidemics and revolutions'.
[5]Phoofolo. 'Epidemics and revolutions'.
[6]Including smallpox (1893); measles (in internment camps 1901–2) and the various polio epidemics of 1918, 1944–5, 1948, 1955 and 1957, and scarlet fever epidemics in 1917–18, 1928, 1931, 1934 and 1941. Harrison, 'Johannesburg and its epidemics'.
[7]Chipkin, *Johannesburg Style*, 199.
[8]See Chipkin, *Johannesburg Style*, 145; Chipkin, 'Preparing for apartheid', 149–74; Gbadegesin, Pienaar and Marais, 'Housing, planning and urban health'; Davids, 'Ideology critique as decolonising pedagogy'.
[9]Harrison, 'Johannesburg and its epidemics', 28.
[10]Clarke, ed., *Like It Was*, 68.
[11]Clarke, ed., *Like It Was*, 68.
[12]Phillips, 'Black October'.
[13]Clarke, 'Civic Works'.
[14]Phillips, 'Black October', 363.
[15]*New True Templar*, November 1918, 4, quoted in Phillips, 'Black October', 71.
[16]Chilvers, *Out of the Crucible*, 211.
[17]Phillips, 'Black October', viii.


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[18]Phillips, 'Black October', 416.
[19]Neither Chipkin nor Van der Waal mention the flu in their architectural histories of Johannesburg. Chipkin, *Johannesburg Style*; Van der Waal, *From Mining Camp to Metropolis*. In *Preparing for Apartheid*, Chipkin notes a large number of flu deaths in the 'Coolie Location' at Klipspruit, Johannesburg, in 1918. Chipkin, *Preparing for Apartheid*, 157.
[20]Tostões. 'Healing Architecture', 23.
[21]De Burger, 28 November 1918, 3, quoted in Phillips, 'Black October', 51.
[22]Fraay-ten Bokkel Huinink, 'Zuid-Afrikaansch Hospitaal en Diakonessenhuis', 39.
[23]Kisacky, *Rise of the Modern Hospital*, 280.
[24]Kisacky, *Rise of the Modern Hospital*, 181.
[25]Including Sanatorium Zonnestraal, Hilversum, the Netherlands, designed by Jan Duiker and Bernard Bijvoet, completed in 1931.
[26]Hanrath, 'Nieuw Zuid Afrikaans Hospitaal te Pretoria', 3.
[27]'The Moedersbond Maternity Hospital', 247.
[28]The institution was closed in 1998, at which time it contained 70 beds. News24. 'MEDI-CLINIC 2008', https://www.news24.com/fin24/Finance-Week/Corporate-Profiles/MEDI-CLINIC-2008-20080929; and Mediclinic, 'Our History', https://www.mediclinic.com/content/dam/mediclinic-com/downloads/en/about-us/mediclinic-history.pdf. Both accessed 28 January 2022.
[29]Van Graan, 'Negotiating modernism in Cape Town'.
[30]Chipkin, *Johannesburg Style*, 14.
[31]World Health Organization, 'Constitution', https://www.who.int/about/governance/constitution. Accessed 17 May 2022.
[32]Phillips, 'Black October', viii.
[33]Phillips, 'Black October', 337.
[34]De Kock, 'Die Kerk'.
[35]Kisacky, *Rise of the Modern Hospital*, 264.
[36]Quoted in Kisacky, *Rise of the Modern Hospital*, 235.
[37]Clarke and Kuipers, 'Tracing tectonic Wilhelmiens'; Clarke and Kuipers, 'Cross continental careers', 71.
[38]Banham, *A Concrete Atlantis*, 23–109.
[39]Niegemen, quoted in Peters, 'Tygerberg hospital Estate', 3.
[40]Wagenaar, 'The architecture of hospitals', 63–4.
[41]Peters, 'Tygerberg hospital Estate', 3.
[42]Peters, 'Tygerberg hospital Estate', 8.
[43]Kisacky, *Rise of the Modern Hospital*, 276.
[44]William Ostwald published *The Colour Primer* in 1916. In it he postulated that harmony could be created by colour order. From 1942 onwards Ostwald published the *Colour Harmony Manual*, which as its name indicates presented a system of complementary colours. Colours presented together (in harmony) have similar wavelengths.

## Declarations and conflicts of interest

### Research ethics statement

Not applicable to this article.

### Consent for publication statement

Not applicable to this article.

### Conflicts of interest statement

The author declares no conflict of interest with this work. All efforts to sufficiently anonymise the author during peer review of this article have been made. The author declares no further conflicts with this article.

## References


Banham, Reyner. *A Concrete Atlantis: U.S. industrial building and European modern architecture 1900–1925*. Cambridge, MA: MIT Press, 1986.

Chilvers, Henley A. *Out of the Crucible, Being the Romantic Story of the Witwatersrand Goldfields and of the great city which arose in their midst*. London, Toronto, Melbourne and Sydney: Cassell, 1929.

Chipkin, Clive M. 'Preparing for apartheid: Pretoria and Johannesburg'. In *Architecture of the Transvaal*, edited by Roger C. Fisher, Schalk W. le Roux and Estelle Maré, 149–74. Pretoria: UNISA, 1998.

Chipkin, Clive M. *Johannesburg Style: Architecture & society, 1880s–1960s*. Cape Town: David Philip, 1993.

Clarke, James, ed. *Like It Was: The star 100 years in Johannesburg*. Johannesburg: Argus, 1987.

Clarke, Nicholas. 'Civic works and community buildings'. In *Common Ground: Dutch–South African architectural exchanges, 1902–1961*, edited by Nicholas J. Clarke, Marieke C. Kuipers and Roger C. Fisher, 75–89. Volendam: LM, 2021.

Clarke, Nicholas and Marieke C. Kuipers. 'Cross continental careers'. In *Common Ground: Dutch–South African architectural exchanges, 1902–1961*, edited by Nicholas J. Clarke, Marieke C. Kuipers and Roger C. Fisher, 67–73. Volendam: LM, 2021.

Clarke, Nicholas and Marieke C. Kuipers. 'Tracing tectonic Wilhelmiens: Dutch–South African heritage and modernity'. In *DOCOMOMO, 2021, 16th International Docomomo Conference Tokyo Japan 2020+1 Proceedings – Inheritable Resilience: Sharing values of global modernities, Vol. 3*, edited by Ana Tostões and Yoshiyuki Yamana, 866–71. Lisbon: Docomomo International, 2021.

Clarke, Nicholas J., Roger C. Fisher and Marieke C. Kuipers, eds. *Common Ground: Dutch–South African architectural exchanges, 1902–1961*. Volendam: LM, 2021.

Davids, M. Noor. 'Ideology critique as decolonising pedagogy: Urban forced removals as a case study'. *Educational Research for Social Change*, 7 (2018): 16–30. [CrossRef]

De Kock, W. 'Die Kerk se ingrypende besluit 'n eeu gelede oor kinderversorging'. *Die Hervormer*, 115, no 6 (2022).

Evans, Richard J. 'Epidemics and revolutions: Cholera in nineteenth-century Europe'. *Past & Present*, 120 (1988): 123–46.

Fisher, Roger C., Schalk W. le Roux and Estelle Maré, eds. *Architecture of the Transvaal*. Pretoria: UNISA, 1998.

Fraay-ten Bokkel Huinink, Dienie. 'Zuid-Afrikaansch Hospitaal en Diakonessenhuis'. *Neerlandia*, 25, no. 3 (1921): 38–9.

Gbadegesin, Job, Michael Pienaar and Lochner Marais. 'Housing, planning and urban health: Historical and current perspectives from South Africa'. *Bulletin of Geography. Socio-Economic Series*, 48, no. 48 (2020): 23–34. [CrossRef]

Hanrath, Johan Wilhelm. 'Nieuw Zuid Afrikaans Hospitaal te Pretoria'. Letter. Hilversum: Architectenbureau Hanrath, Het Neiuwe Insituuut, Rotterdam, HANR0406, t722–t730, 1929.

Harrison, Philip. 'Johannesburg and its epidemics: Can we learn from history?'. *GCRO Occasional Paper*, 16 (2020). [CrossRef]

Kisacky, Jeanne S. *Rise of the Modern Hospital: An architectural history of health and healing, 1870–1940*. Pittsburgh: University of Pittsburgh Press, 2017.

Le Huec, J.C., L. Boué, S. Bourret, M. Saffarini and M. Le Verge. 'Epidemics over the centuries'. *Neurospine*, 17, no. 2 (2020): 334–6. [CrossRef] [PubMed]

Mediclinic. 'Our history'. Accessed 28 January 2022. https://www.mediclinic.com/content/dam/mediclinic-com/downloads/en/about-us/mediclinic-history.pdf.

'The Moedersbond Maternity Hospital and Training School in Pretoria'. *The Journal of the Medical Association of S.A. (BMA)* 2, no. 9. (May 1928): 247.

News24. 'MEDI-CLINIC 2008'. Accessed 28 January 2022. https://www.news24.com/fin24/Finance-Week/Corporate-Profiles/MEDI-CLINIC-2008-20080929.

Peters, Walter. 'Tygerberg Hospital Estate (TGB HE): Architectural assessment'. Cape Town, Unpublished report, 2018.

Phillips, Howard. 'Black October: The impact of the Spanish influenza epidemic of 1918 on South Africa'. PhD dissertation, University of Cape Town, 1984.

Phoofolo, Pule. 'Epidemics and revolutions: The rinderpest epidemic in late nineteenth-century Southern Africa'. *Past & Present*, 138 (1993): 112–43.

Tostões, Ana. 'Healing architecture in Portugal'. In *Cure & Care: Architecture and health*, edited by Ana Tostões, Daniela Arnaut and Paulo Providência, 9–11. Lisbon: IST-ID, 2020.



https://doi.org/10.14324/111.444.amps.2023v24i1.002

Van der Waal, Gerhard-Mark. *From Mining Camp to Metropolis: The buildings of Johannesburg 1886–1940*. Melville: Chris van Rensburg Publications, 1987.

Van Graan, André. 'Negotiating Modernism in Cape Town: 1918–1948. An investigation into the introduction, contestation, negotiation and adaptation of modernism in the architecture of Cape Town'. PhD dissertation, University of Cape Town, 2011.

Wagenaar, Cor. 'The architecture of hospitals'. In *Cure & Care: Architecture and health*, edited by Ana Tostões, Daniela Arnaut and Paulo Providência, 63–9. Lisbon: IST-ID, 2020.


https://doi.org/10.14324/111.444.amps.2023v24i1.002