

RURAL HEALTH HISTORY

The role of transport and telecommunications technology in the development of the Scottish Highlands and Islands Medical Service: a historical perspective

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ABSTRACT:

The Highlands and Islands Medical Service (HIMS) was introduced across the Scottish Highlands and Islands region after the publication of the Dewar Report in 1913. It was the first state-funded medical service in the UK and one of the first in the world.

The Dewar Committee recommended the establishment of HIMS following research into healthcare provision in the region, concluding that there was insufficient provision. Among Dewar's major findings were the lack of sufficient transport infrastructure,

high transport costs and low availability, and the lack of telecommunication services. This historical study with current relevance has addressed the contribution of transport and telecommunication technologies to the overall success of the Highland and Islands Medical Service. We have considered the crucial role of developments in the transport and telecommunications industries in overcoming contemporaneous healthcare problems.

Through the study of contemporary letters, newspaper articles and government reports, this study assesses whether the views expressed at the time agree with the central contention that automobiles and telecommunication services were essential to the success of HIMS. This study also assesses the parallels drawn between the problems faced by HIMS in the 1900s and modern-day rural healthcare providers.

Automobile use allowed those in the Highlands and Islands to commute with far greater ease, indirectly allowing doctors and members of the healthcare team to travel to see patients further

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Introduction

The Highlands and Islands Medical Service (HIMS) was introduced across the Scottish Highlands and Islands in 1913 after the Dewar Committee, chaired by Sir John Dewar concluded, following detailed investigation, that 'the provision of medical attendance in districts situated in the Highlands and Islands of Scotland'¹ was inadequate. Scholars such as Crossfil have argued that HIMS was a direct precursor of the UK National Health Service². Although the origins of HIMS have been studied extensively^{2,3}, the relationship between the service and technological changes in the early 20th century has not been examined.

In this article we assess the contribution of transport and telecommunications technology introduced or supported by HIMS in resolving healthcare difficulties in the Highlands and Islands and the extent to which the success of HIMS depended on developments in non-medical industries. Examples of these technologies on Scottish islands are given, although the focus is the Scottish mainland and thus maritime transportation is not discussed.

Contemporary letters, newspaper articles and government reports reveal the transport and communication problems located by Dewar before HIMS formation. Two prominent problems arose repeatedly. The first was the inhabitants' lack of telegraph and telephone services in emergencies: Dr Roger McNeil reported that 'the difficulty of communication sometimes makes it impossible to get medical attendance in time to save life'¹. The Dewar Committee acknowledged that 'efforts are often made to communicate by telegraph, which for purposes of medical inquiry and advice is cumbersome and unsatisfactory'¹. The second

afraid and in greater numbers due to reduced travelling time. Additionally, funds provided by other government departments as well as HIMS allowed telecommunication technology to develop in the region, resulting in improved communication between widely dispersed healthcare workers, thereby improving healthcare provision.

Prior to the formation of HIMS, the Highlands and Islands region in Scotland struggled to provide sufficient health care to its residents. The formation of HIMS resulted in improved health care in the region while simultaneous developments in the transport and telecommunication industries occurred. Past scholars have established links between the transport and telecommunication industries and healthcare provision in several countries. This study has contributed to existing literature by providing an insight into the relationship between such services in the Highlands and Islands region as well as rural life in the early 1900s. To conclude, the development of the transport and telecommunications industries acted synergistically with HIMS to lead to success in provision of good health care in the region.

problem was the lack of available transport. The committee reported that the use of 'automobile locomotion' could 'double the working capacity of the existing medical service'¹. A Dewar Committee meeting highlighted doctors' difficulty traversing rural terrain. Mr Graham, a fisherman on the tiny island of Rona, to the east of Skye, reported they may have to 'wait a fortnight for him, and the patient will be suffering pain all that time'⁴. This reflects on the multitude of transport modalities needed for island travel, but nevertheless adds to the argument about sufficient automobile provision to travel land distances.

The pre-existing problems resulting from inadequate transport and telecommunication services were reduced with HIMS formation. An annual government grant of £42,000⁵ made HIMS the first state-funded medical service in the UK and one of the first globally. As well as supporting doctors' salaries⁶, it explicitly provided money to buy automobiles⁷ and to improve telegraph and telephone services⁸.

Did contemporaries claim that automobiles and telecommunication services were essential to the success of HIMS? In other geographical areas and at other times the importance of such communication had been recognised. Berger, for example, reported on the crucial historical impact of the automobile on rural healthcare provision in the USA (around the time of HIMS)⁹: he concluded automobile use shortened time spent travelling for the doctor, improved patient care and improved professional life⁹. More limited literature has addressed the impact of communication technologies in European rural health care¹⁰. Automobile use was shown to be vital for effective care in rural Norfolk in 1985¹¹. But there has hitherto been no study focused on rural Scotland.

Transport development in the Scottish Highlands and Islands in the HIMS era

The introduction of HIMS resulted in increased automobile use in the Highlands and Islands. The Scottish Insurance Commissioners, a body created to implement the provisions of the *National Insurance Act (1911)*, allocated mileage grants to the service in both 1913 and 1914¹² to be used toward medical automobile purchase costs and fuel. The view that automobile use was key to the implementation and success of the service is supported through this ring-fencing of funds. Previously, doctors working in this area could not generally afford to buy automobiles¹ and one described trying to obtain the funds required as 'in a great many cases almost insuperable'⁷. Many clinicians in the Highlands and Islands area experienced problems in travelling over difficult terrain. In 1930 a doctor wrote that travel caused much 'hardship and discomfort'¹³. Another member working in Sutherland stated that 'there was no class of men more alive to the advantages of increased speed in transport than the Highland medical practitioners'⁷. The district nurse Flora Ferguson in Inverness-shire had previously 'walked, cycled or hired transport in order to attend patients' but in 1926 she acquired an automobile through HIMS funds¹⁴.

The importance of automobiles was acknowledged by Alexander Shearer, Medical Officer for HIMS, in an address in 1931. He stated that 'the provision of motor transport ... has almost revolutionised the service'¹⁵. Personal accounts of those working in HIMS suggest that automobiles were key in overcoming rural health problems in HIMS districts.

Some communities felt that, even as HIMS developed and expanded, their healthcare provision remained inadequate. The *Scotsman* newspaper published the 'Scottish secretary's answer to complaints: transport problems'¹⁶ in 1935. A senior Scottish politician considered that settlements in the far north would be unable to receive the same services as those in 'more accessible and thickly populated parts of the country' due to costs being too high. The government had reported as early as 1924 that any development in general transport services would be advantageous to the medical services¹⁷. However, cost remained a barrier, and remote areas, such as Muck, one of the Small Isles of the Inner Hebrides, did not possess any automobiles as late as 1938¹⁸. The Isle of Muck is small, both geographically and in population number, although automobile use to lessen travel time on limited road surfaces may have been key.

In 1930, a Dr Jamerson recalled high maternal death rates prior to the formation of HIMS¹⁹ and reported that the number of mothers dying was afterwards 'diminished to few'¹⁹. Dr Jamerson's findings remain relevant. A study in rural South Africa concluded that decreased transfer times by ambulance are associated with improved maternal and foetal death rates²⁰. WHO has concluded that maternal mortality 'is higher in women living in rural areas'²¹. Although there are several possible explanations, studies have supported the view that a lack of transportation systems is a key factor^{22,23}. Research conducted in rural Ghana concluded, for example, that maternal health remained at risk due to the

country's health service failing to improve transport service provision²⁴. The study linked poor road development with the health authority failing to appreciate the 'social-cultural, economic, as well as geographic characteristics' of the area²⁴. This supports our contention, above, that the high costs of automobiles and transportation services led to the slower development of services. The case of HIMS has indicated that merely providing additional doctors or medical supplies could not solve the problem for rural communities; what was needed, and what happened in Scotland, was support for the development and maintenance of key transport infrastructure.

As time progressed, flight transportation was introduced in the Highlands leading to rapid access to secondary care services²⁵. This further strengthens our argument: medical personnel at the time pushed for prompt transportation services to give patients equal care to those in urban districts.

Telecommunication services in the Scottish Highlands and Islands in the HIMS era

Changes in telecommunication services, such as telegraphs and telephones, enabled new communication pathways across long distances between healthcare professionals.

A case reported in the *Scotsman* in 1937 illustrates the key role of telephony²⁶. Residents on Raasay, a small island east of the Isle of Skye, sent a petition to Sir Murdoch Macdonald, member of parliament for Inverness-shire. The petition described medical care on the island as 'most deplorable' since damage occurred to the telephone cable that ran to nearby Skye. When the cable was operational, the nurse on Raasay was able to speak directly with Skye's medical officer in Portree, a village on the east coast of the island. A similar scenario occurred in rural Victoria, Australia in 2012²⁷. There, a telephone provider's services were disabled for over 12 hours and three problems occurred: 'communication (with patients, health or emergency services), provision of investigation results and management of patients 'at risk''²⁷. Both cases highlight growing dependence on telecommunication technology despite it not being available in remote areas.

In contrast to the negative attention in April 1937, the *Scotsman* published a further article regarding telephones in Shetland in October 1937²⁸. It described island improvements that would eventually allow wireless telephony to be installed, and when the works were complete they would 'be useful for life-saving as well as for ordinary communication'²⁸. A combination of government service work and HIMS funding allowed communication problems to be overcome to improve health care across the region. The recognition of needing to improve health care in the region propelled an improvement in transport and communication services.

In parallel with transport development, those arguing for improved communication had to campaign for financial support. The Department of Health for Scotland stated in 1934 that it had 'no hesitation'²⁹ in reporting the improvement of telephone services would benefit health services. However, 'the funds at the disposal of the Department are not available for assisting in these

directions²⁹. The acknowledgement of the high costs of installing telephone services has been appreciated elsewhere³⁰ and is still apparent today. A study in 2013 highlighted the difficulties of installing telemedicine operations (communicating health information electronically) into rural Africa³¹. High connection costs in addition to high poverty rates resulted in low levels of telemedicine development. This closely aligns with the problems faced in the Scottish Highlands and Islands prior to HIMS.

The outbreak of World War I shortly after the formation of HIMS indirectly resulted in long-term financial benefits for the service. World War I slowed the initial development of HIMS⁵ and increased transport costs³², but emergency telegraph and telephone circuits used in the war were kept, provided that they could 'serve a useful public service'³³. Telecommunication service installation costs had been covered, thereby saving HIMS funding. Grants were given by the Scottish Board of Health and the Board of Agriculture for Scotland to maintain the emergency circuits. Otherwise, telegraph services were provided by the General Post Office across the country³⁴.

Conclusion

This study aimed to establish a link between the transport and telecommunication industries and the success of HIMS. The challenges of providing adequate health care in rural, rather than urban, areas are well recognised³⁵ and the influence of poor transport infrastructure on health care remains in many rural areas today²⁵. Previous historical work has established the relationship between adequate transport and telecommunication services and

rural health care provision, but this early example of a state-supported medical service in the Highlands and Islands provides a unique perspective on the role of government initiatives.

First, in agreement with the existing literature, automobile use reduced commuting problems in the rural Highlands and Islands region. HIMS doctors and nurses were able to see more patients due to reduced transportation times, and doctors gained increasing amounts of personal free time. However, some settlements in the Highlands and Islands region experienced ongoing financial limitations.

Second, the development of telegraph and telephone communication was already being pursued in the HIMS region. HIMS did contribute funds to this cause, although it would have been unable to develop such a network without other government service support. The use of telegraphs and telephones improved access to care on remote Scottish islands, allowing resident nurses to be in direct contact with mainland healthcare workers.

It can be concluded that a synergy between HIMS, the transport industry and the telecommunications industry led to its success. Funds provided by HIMS helped to disseminate the newly marketed technologies of the automobile, and domestic and business telephone. Further study should focus on the initial road network development in the Scottish Highlands and Islands. Together with automobile access, this will provide a fuller picture of medical service provision in the Scottish Highlands and Islands at the time of introduction of HIMS.

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