

Onofrio Scassi (1768-1836) and the dissemination of smallpox vaccination practices in the Ligurian Republic (1797-1805) and during the Napoleonic Empire (1805-1814)

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Keywords

Onofrio Scassi • Smallpox vaccination • Ligurian republic • Napoleonic Empire • History of vaccine • History of public health and hygiene

Summary

For centuries, humans sought to contain the devastating effects of smallpox. Indeed, as early as the 2nd century BC, a method called “variolation” was utilised to combat the disease. It was not until 1798, however, that the English physician and naturalist Edward Jenner invented a more effective technique of immunization, which he called vaccination. Among the various personalities who strove to spread Jenner’s sensational innovation throughout Italy, the Ligurian doctor Onofrio Scassi played a prominent role. Onofrio Scassi (1768-1836) studied medicine in Genoa, graduat-

ing in 1788. He subsequently developed his skills further at the University of Pavia and in the United Kingdom. Upon returning to Genoa, in addition to holding various public offices, he was among the first to practise smallpox vaccination in Italy.

Moreover, in 1801, he was one of the founders of the Medical Society of Emulation, which worked for years to spread the practice of vaccination between the period of the Ligurian Republic (1797-1805) and the years in which Genoa was part of Napoleon’s French empire (1805-1814).

Background

For many centuries, smallpox posed one of the most serious threats to human health. Caused by a virus belonging to the Variola family, this highly contagious infectious disease was originally widespread in Asia, Africa and Europe, from where it later spread to the Americas and the rest of the world (causing high mortality among native peoples, who lacked antibodies against the disease) [1].

Its devastating impact stemmed not only from its rapid spread but also from the severity of its symptoms and the high mortality rate associated with infection.

Smallpox initially manifested itself through high fever and headache; subsequently, within 12-15 days, pustular rashes developed all over the body. The disease was fatal in 50% of cases and often left survivors with permanent disfiguring scars (and, in some extreme cases, caused blindness) [2].

Given these devastating consequences, communities across different regions sought ways to prevent or mitigate the effects of the disease, despite their limited medical knowledge.

Over the years, to counteract the terrible and potentially lethal effects of this disease, people tried to limit its impact by implementing the scant knowledge of hygiene and health at their disposal.

The earliest preventive practice developed, known as “variolation”, had been used for centuries in Asia and

parts of Africa. The technique consisted of deliberately exposing healthy individuals to material obtained from smallpox lesions in order to induce a mild infection and confer immunity. Despite the risks associated with the procedure, variolation significantly reduced mortality compared with naturally acquired smallpox and constituted an important precursor to modern vaccination [3].

In particular, this practice involved inoculating a healthy patient with material taken from the pustules of a patient infected with a mild form of smallpox (*Variola minor*).

In this way, the less dangerous form of smallpox was deliberately caused in the healthy patient, thus making him immune to the most lethal form, too.

For a long time, this technique remained the only method of preventing the disastrous and lethal effects of smallpox, and was, indeed, fairly efficacious (though it made the “variolized” patient a vehicle for the spread of the disease and also exposed him to the risk of contracting other diseases, such as tuberculosis or syphilis, as well as developing bacterial infections) [4].

Introduction

The first news regarding the practice of variolation reached Europe at the beginning of the 18th century [5] through the reports of some doctors who had visited Istanbul. These included Emanuel Timoni (1669-1720)

and Giacomo Pilarino (1659-1718) [4].

- **Emanuel Timoni** was a Greek physician from Constantinople who played a significant role in introducing variolation to Western Europe. He studied medicine at the University of Padua and later worked in the Ottoman Empire, where he became familiar with the local practice of smallpox inoculation. Like Giacomo Pilarino, he observed that variolation involved inducing a mild form of the disease in order to provide protection against more severe infection [6].
- **Giacomo Pilarino**, was a physician trained; he was a notable early European advocate of variolation; while working in the Ottoman Empire, he became familiar with the practice of variolation and later helped introduce it to Europe. In 1715, he published a treatise describing the method and supporting its use as a preventive measure against smallpox, contributing to its gradual acceptance among European physicians.

It was, however, the determination of a woman, Lady Mary Wortley Montague, that actually brought this practice to the attention of European medicine, subsequently enabling it to spread throughout Europe. Nevertheless, the practice was short-lived in Europe. Indeed, less than 80 years after its introduction and diffusion across the continent (the technique being adopted at various royal courts, such as those of France, Prussia

and Austria, for example), it was superseded by a more effective method of immunization – designed in 1796 by the English physician and naturalist Edward Jenner (1749-1823) (Fig. 1). Jenner's method of immunization, which he called 'vaccination', involved inoculating a healthy patient with secretions from animals or humans affected by cowpox, a mild disease related to smallpox. In this way, the patient would also develop immunity to the much more dangerous and lethal form of human smallpox.

Today, however, we know that Jenner was not actually the first person to use vaccine material to immunize patients against smallpox. Indeed, many English doctors living in cattle-rearing areas were already familiar with this method. Jenner, however, had the undisputed merit of conferring scientific status on the practice of vaccination by demonstrating empirically that the technique elicited immunity to smallpox [7].

Moreover, he spread knowledge of his method systematically through the publication, at his own expense, of his pamphlet *An Inquiry into the Causes and Effects of the Variolae Vaccinae, a disease discovered in some of the western of England, particularly Gloucestershire and Known by the Name of Cow Pox* in 1798 [8].

Jenner's innovative method soon spread from England throughout Europe, including Italy. The adoption of vaccination in Italy was due partly to individual efforts (by far-sighted doctors eager to leave their mark on the history of medicine) and partly to collective undertakings (as a result of international scientific collaboration established by some Italian medical circles) [9].

Among the most emblematic personalities involved in the diffusion of Jenner's method in Italy were:

- Luigi Sacco (1769-1836), the first doctor to use vaccine material gathered in Italy [10];
- Michele Troja (1747-1827), Antonio Miglietta (1767-1826), Domenico Cotugno (1736-1822) and Gennaro Galbiati (1766-1844), who were among the first doctors to introduce vaccination into the Kingdom of Naples [11, 12];
- Giacomo Barzellotti, one of the first advocates of smallpox vaccination in the Grand Duchy of Tuscany [13];
- Pietro Moscati (1739-1824), who, having already been a fervent supporter of variolation, tried to spread the practice of smallpox vaccination in Milan and Lombardy [14, 15];
- the Ligurian doctor Onofrio Scassi (1768-1836), who was the first to spread vaccination in Liguria (and perhaps the first to practise it in Italy) [16].

Onofrio Scassi, the son of a doctor, Agostino Scassi, was born in Cogoleto (Genoa) in 1768 (Fig. 2) [17]. He studied medicine in Genoa, graduating in about 1788. He then attended at the University of Pavia the lectures of the doctor and hygienist Johann Peter Frank (1745-1821), considered by many to be the founder of modern public health, and those of the doctor, surgeon and anatomist Antonio Scarpa (1752-1832), remembered for his studies on aneurism, on congenital clubfoot and on hernias.

His decision to pursue his studies at the University of

Fig. 1. This is a famous portrait of Edward Jenner painted by John Raphael Smith. In the background, the English countryside is depicted with several cows grazing near a farmwoman – both of them the most important figures in Jenner's discovery of the smallpox vaccination.



Fig. 2. This is one of the few potrait available of Onofrio Scassi. It's a XIX century engraving that depicts the famous Ligurian physician at work in his study. From: itale V. Onofrio Scassi e la vita genovese del suo tempo (1768-1836): con appendice su Raffaele Scassi. Società Ligure di Storia Patria: Genova 1932.



Pavia was by no means casual. Indeed, the University of Pavia was one of the liveliest cultural centres of the time, boasting among its professors, in addition to the above-mentioned Scarpa and Frank, also Lazzaro Spallanzani (1729-1799) and Alessandro Volta (1745-1827) [18].

After his study period in Pavia, the young Ligurian doctor decided, probably on the advice of William Batt (a doctor of English origin who had lived in Genoa since 1771), to go to England and then to Scotland in order to perfect his studies.

It was in Edinburgh in particular that Scassi received his greatest recognition, being enrolled in the Royal Medical Society and publishing (in 1792) one of his first important works: *De foetu humano. Dissertatio anatomica-physiologica acutore Onuphrio Agnese Scassi, Genuensi, philosophiae et medicinae doctore, Regiae Societatis Medicae Edim. Membro* [19].

Having returned to Genoa in 1794, he was (thanks to the fame he had acquired abroad) registered with the College of Physicians and was charged by the Genoese sanitation office with monitoring and containing an epidemic that had broken out in western Liguria (between Savona and Ventimiglia).

With the fall of the Genoese Republic in June 1797, Scassi promptly joined the newly formed Ligurian Republic, obtaining the command of a company of the national guard. On the occasion of the legislative elections (the only case of elections held in the whole of Italy in that period), he was selected to compose the body of second-degree electors.

The following year, when he had already been appointed to the chair of theoretical medicine at Pammattone Hospital, Scassi began to assume an increasingly political role – in addition to his scientific one – which saw him become president of the College of Physicians and a member of the National Institute.

It was precisely within this prestigious body that Scassi presented the government a project for the reform of studies, which, however, was not implemented [20].

Indeed, precisely at that historical juncture, the Ligurian Republic was going through the most critical phase of its brief existence; in 1799, it bore the brunt of a counteroffensive by the powers of the first anti-Napoleonic coalition, which besieged Genoa for a long time (bringing famine and epidemics to the city) and temporarily conquered it in 1800 [21-23].

Paradoxically, it was precisely during that terrible period in the life of the Ligurian Republic that Scassi, thanks to the help of his colleague Batt, was able to contact the famous Geneva doctor Louis Odier (1747-1817) in order to obtain some vials of vaccine pus and put into practice Jenner's sensational technique of vaccination.

Although the first news of this innovative method of vaccination had reached the ears of Scassi and Batt immediately after the publication of Jenner's pamphlet, it was only later, in the autumn of 1800, that Scassi managed to carry out the first smallpox vaccinations.

In that same autumn, the doctor Luigi Sacco first succeeded in using vaccine material gathered in Italy, thereby obviating the long waiting times required to obtain vaccine pus from northern European countries.

Scassi's first experience as a vaccinator prompted him to publish a short pamphlet the following year, in which he reflected on the methods of inoculation and the potential critical issues of the practice [24]. On one hand, thanks to the discovery by Sacco, vaccinations in Italy were able to avoid the long waiting times for vaccines pus coming from abroad. On the other hand, thanks to the pamphlet published by Scassi, the technique for vaccinating was explained in the finest detail to all Italian doctors eager to put it on practice.

In the wake of this public commitment, which probably stemmed from the ideas of Johan Peter Frank (according to whom health was a collective good which had to be protected by the State) [25], Scassi, together with several other doctors and personalities from the Genoese healthcare environment (including William Batt, Luigi Marchelli, the Mojon brothers, Antonio Mongiardini and Domenico Viviani) actively participated in the founding of the Genoa Medical Society of Emulation in July 1801. The task of the newly established Society was simple: to constitute a meeting point for the various personalities involved in the health field, in order to "share their insights

Fig. 3. Plan of the city of Genoa made at the beginning of the XIX century. This figure shows the ancient fortification of the city and the inhabited centers of the surrounding valleys.



and the successful results of their observations” and, furthermore, to spread the practice of vaccination throughout Liguria [26]. The Medical Society remained active for the last years of the Republic (1801-1805) and for the entire period in which Genoa and Liguria were an integral part of Napoleon Bonaparte’s Empire (1805-1814), promoting the publication of various scientific pamphlets, including those concerning smallpox vaccination, and collaborating in the immunization of the Genoese population (Fig. 3) [27].

As in other parts of Italy, however, the vaccination campaign animated by the various members of the Society, especially Luigi Marchelli [28] and William Batt [29-31], only moved beyond the experimental phase during the Napoleonic era, through the intervention of the Central Vaccination Committees established by order of the French government in every department of the Empire. Although the vaccination policies applied in the French Empire and in the Kingdom of Italy have been studied quite in depth, a detailed study is still missing on the practices, policies and results that these had in the Ligurian territory.

Onofrio Scassi during the Kingdom of Sardinia

After holding various public offices, both in the Ligurian Republic (of which he also became a senator in 1804) and in the French Empire, Scassi also managed to carve out important public roles for himself within the subsequent institutional structure that the city of Genoa (along with the whole of Liguria) assumed in 1815 on the occasion

of its annexation to the Kingdom of Sardinia [32].

Having recognized Scassi’s great merits in the scientific and administrative fields, the new ruling dynasty appointed him Honorary Physician of the Royal House of Savoy (1815), and conferred upon him the title of Count of the Kingdom (1825) and, subsequently, the title of Knight of Saints Maurice and Lazarus, one of the oldest order of knighthood in the world (1831).

Conclusion

The development of smallpox vaccination in Liguria represents an important example of the change of a pioneering medical innovation into an increasingly organized and institutionalized public health intervention. The experience of the Ligurian Republic and the subsequent Napoleonic administration offers a compelling example of how the successful implementation of preventive measures depended not only on scientific advances but also on the establishment of administrative structures capable of coordinating health policies, mobilizing local authorities, and fostering public trust in vaccination practices. Within this context, physicians such as Luigi Marchelli, William Batt, and, above all, Onofrio Scassi played a pivotal role in translating Jennerian vaccination from a promising scientific discovery into a practical and widely disseminated instrument of disease prevention. Their activities contributed to the creation of a network linking medical expertise, civic institutions, and political authorities, thereby facilitating the acceptance and

diffusion of vaccination among the population. The case of Scassi is particularly emblematic for the close relationship that emerged between medicine, public administration, and social responsibility during the early nineteenth century. Throughout his career, including his service as Mayor of Genoa between 1830 and 1834, he remained actively committed to the promotion of smallpox vaccination, continuing this work until his death in 1836. His long-standing dedication reflects the growing awareness, among physicians and policymakers alike, of the collective value of preventive medicine and population-based health intervention. More broadly, the historical experience examined in this study demonstrates that many of the principles now regarded as essential foundations of modern public health were already emerging during the formative decades of vaccination practice. The gradual development of immunization programs was not simply a medical achievement but also a complex social, institutional, and cultural process that required the integration of scientific knowledge, governmental commitment, effective communication strategies, and active public participation. These elements, which continue to define successful public health interventions today, were already evident in the efforts of early vaccination advocates who sought to promote acceptance of vaccination and expand its reach among diverse populations.

In this context, revisiting the contributions of pioneers such as Scassi provides more than a historical reconstruction of early vaccination campaigns. His work illustrates how the success of preventive medicine has always depended on the ability to translate scientific evidence into practical policies, to build public trust in health authorities, and to foster collaboration between medical professionals, local institutions, and communities. By examining the challenges he faced – including resistance to vaccination, implementation challenges, and the need for public education – we gain valuable insight into the enduring dynamics that continue to shape vaccination programs worldwide. Furthermore, the historical perspective offered by figures like Scassi helps highlight the historical roots of contemporary public health challenges. Present-day concerns surrounding vaccine hesitancy, misinformation, public confidence in scientific expertise, and equitable access to preventive healthcare are not entirely new phenomena; rather, they represent modern manifestations of issues that have accompanied vaccination efforts since their inception. Understanding how these challenges were addressed in earlier periods can therefore provide useful lessons for designing more effective vaccination policies and communication strategies in the present day.

The enduring relevance of these pioneers lies not only in their historical achievements but also in the insights their experiences provide for present-day public health practice. Their experiences demonstrate that the effectiveness and legitimacy of public health systems are the result of long-term processes involving scientific innovation, political support, and societal engagement. By highlighting the enduring interplay between scientific

innovation, institutional action, and community engagement, this legacy provides an interpretative framework for contemporary public health practice and the development of global vaccination strategies, suggesting that the control of infectious diseases in an increasingly interconnected world may depend on the sustained integration of scientific knowledge, governance capacity, and collective engagement [33].

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Authors' contributions

EB: conceived the study. EB, MM: designed the study; drafted the manuscript; performed a search of the literature; revised the manuscript; conceptualization and methodology; investigation and data curation; original draft preparation; review; editing.

All authors have read and approved the latest version of the paper for publication.

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