Administering Vaccination in Interwar Algeria:
Auxiliaires médicaux*, Smallpox, and the Colonial State in the *Communes mixtes

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It is a rain-soaked November afternoon in the city of Constantine in eastern Algeria. I am ensconced in the regional archives, searching for records relating to colonial-era disease control in Algeria's *communes mixtes* (mixed communes). In place from 1858 to 1956, these colonial administrative units covered immense swathes of rural territory, encompassing *centres de colonisation* inhabited by a "mixed" population and outlying Muslim villages and settlements—the *douars*—under the sole charge of a centrally appointed administrator.[1] In one archival box relating to the *arrondissement* of Bougie (Bejaïa), I find an improvised booklet constructed from quadrille paper threaded together with string. Sloping cursive lettering on the title page proclaims this to be a vaccination logbook: "Year 1936. Protection of Public Health (decree of 27 May 1907). Service of vaccination and revaccination. Mr AMRANE Mohand, vaccinator." I immediately recognise Mohand ould Ramdan Amrane as one of the *auxiliaires médicaux* (medical auxiliaries), also known as *adjoints techniques de la Santé publique*, whose careers I have been tracking through personnel files and correspondence in the Algerian National Archives. Amrane and a colleague have recorded the full name and age of each man, woman, and child visited during compulsory smallpox vaccination sessions in the mountaintop villages of Bouhamza, Tamokra, Igram, and Chellata in the *commune mixte* of Akbou. The following week, now enjoying clear and sunny skies in Tlemcen, I find myself discussing the history of medicine with a physician who considers state medicine in rural Algeria during the colonial period to be a contradiction in terms. I mention the discovery of Amrane's vaccination register in the Constantine archives. "Impossible," bristles the doctor, I could not have seen such a thing in the archives. He insists that rural public health was "completely forgotten" and there were no vaccinations in rural Algeria until the advent of the *Sections administratives specialisées* (SAS) in the late 1950s.

The lives and careers of medical auxiliaries have been obscured in histories of medicine and colonialism in Algeria. By reflecting on the biography of the doctor in Tlemcen it is possible to discern some of the reasons for this. Growing up in Tlemcen, my interlocutor was a young witness to the Algerian War and went on to study medicine in the first flush of national independence. His disinclination to believe in archives of interwar vaccination campaigns was no doubt informed by nationalist ideology but may also have been formed by the propaganda of a dying colonialism. During the Algerian War claims to be providing health care were simultaneously claims to hold political legitimacy on both sides of the conflict.[2] My interlocutor may have believed that vaccinations began in the late 1950s because of the publicity given to the military-run SAS, which performed security and welfare work in rural areas. Similarly, he assumed that the colonial state had made no attempt to engage rural populations in medical or sanitary initiatives prior to this point because French propaganda policies

Final version: Hannah-Louise Clark, 'Administering Vaccination in Interwar Algeria: Medical Auxiliaries, Smallpox, and the Colonial State in the *Communes mixtes*', *French Politics, Culture & Society* 34.2 (2016): 32-56. DOI:10.3167/fpcs.2016.340203

during the Algerian war said it was so, in order to undermine the notion that Algeria's Muslim population genuinely wanted independence. For if rural villagers had never really encountered the French "civilizing mission" in the form of medicine and public health, how could they wish to reject it?

This article undertakes to explain and historicize colonial smallpox vaccination campaigns in twentieth-century Algeria and how they were applied in the *communes mixtes*. Smallpox is a virulent, highly visible infection transmitted by person-to-person contact.[3] In Asia and Africa, communities historically protected themselves during smallpox outbreaks by means of variolation. In Algeria, this sometimes took the form of extracting opaque fluid from the pustules of a smallpox sufferer and introducing it into a scarification or incision on the back of the hand, upper arm, or leg of a non-sufferer in the hope of producing a mild case from which the subject would recover.[4] This technique was introduced to Europe in the early eighteenth century. In 1798 Edward Jenner developed an alternative technique using "cowpox," which conferred protection against the disease and was found to be safer than inoculations with smallpox itself.[5] In nineteenth-century Algeria, doctors with the Military Offices of Arab Affairs (the *Bureaux arabes*) had introduced and promoted the new method of vaccination as a mark of French "civilization."[6] In parallel, these medics raised doubts about the efficacy of variolation. By the close of the nineteenth century, as Pasteurian science became implanted in Algeria with the opening of the *Institut Pasteur d'Alger* in 1894 (precursor to the *Institut Pasteur d'Algérie*), the settler medical establishment in Algiers was no longer prepared to tolerate variolation. "Native agglomerations" in the *communes mixtes* and the practice of variolation were identified as the source of "nearly all, if not all" cases of smallpox in European settlements.[7] This was a subjective claim based on individual testimonies gathered from European doctors; insofar as variolation was performed in the course of epidemics, and there was no formal system of data collection in the *communes mixtes*, it was impossible to establish a basis for comprehensive analysis. Nevertheless, the putative relationship between variolation, "native" infections, and European victims would give rise to racialized and gendered vaccination practices in Algeria with the passage of the *décret du 27 mai 1907 relatif à l'application en Algérie de l'article 6 de la loi du 15 février 1902 sur la vaccination et la revaccination*.

The 1907 decree on vaccination and revaccination was, first and foremost, a means of protecting the health and long-term survival of European settlement in Algeria. As is well known, the mass of European settlers in Algeria established themselves predominantly in cities and *communes de plein exercice*.[8] Colonial infrastructure and investment were concentrated in these areas, which were administered along metropolitan lines. The majority of the autochthonous population—three-fifths of the Muslim population in the interwar period—remained in or were displaced to the *communes mixtes* where they eked out a bare existence on marginal lands.[9] Pilot vaccination campaigns in 1909 and 1910 largely excluded these territories, because the colonial state possessed neither the resources nor a sufficient supply of vaccine to enforce the 1907 decree.[10] It was not until after WW1 public health crises combined with long-standing racialized fears of contagion and the objective of *mise en*

valeur to make Muslim villagers a more systematic target of smallpox vaccination.[11] This was achieved in part thanks to the efforts of subaltern functionaries such as Mohand Amrane whose experiences as vaccinators run through this account.

Algeria's medical auxiliaries were a technical elite trained in bacteriological medicine and hygiene and employed by the colonial state. Upwards of 300 entered into training between 1904 and c. 1960, with the result that by the mid 1930s, Muslim and Jewish doctors and Muslim medical auxiliaries outnumbered Europeans in the ranks of the *Service médical de colonisation* and the *Assistance médicale des indigènes*, two complementary structures that provided limited services in the *communes mixtes*.[12] Medical auxiliaries were involved in the "administration" of vaccination among Muslim villagers in both senses of the term. Responsible for traversing thousands of kilometers of countryside in order to introduce glycerinated calf-lymph into multiple incisions made on the arms and hands of children and adults, they also became involved in the procedure's documentation. Vaccination was a procedure that required two separate contacts between vaccinators and villagers: inoculation of vaccine into a linear incision in the skin (typically on the deltoid-V of the shoulder or the thigh), followed by examination of the vaccination site for signs that the vaccination had taken a week or so later.[13] This meant that it relied on paper technologies as well as a medical technique, since some kind of written record was needed to identify the targets for vaccination and to ensure the follow-up inspection of the itchy red bump of vaccinees. The paper trail of vaccination constituted a managerial instrument for colonial officials and a source of data for technicians at the Institut Pasteur; now it serves as an archival trace for the historian.

Centralized paperwork is associated with modernity, as Max Weber argued: "The combination of written documents and a continuous operation by officials constitutes the 'office'' (*Bureau*) which is the central focus of all types of modern organized action."[14] However, recent scholarship has challenged Weberian views of bureaucratic rationality as the hallmark of hierarchy, transparency, and predictability. Sociologists and historians of science, legal theorists, anthropologists, and historians of empire have increasingly focused their attention on the power of paperwork and files to actively shape knowledge in the world, rather than simply being passive sites for the inscription and storage of knowledge, in ways that are discretionary, piecemeal and even potentially subversive.[15] Bhavani Raman's study of writing and paper in the bureaucracy of early colonial South India provides one such example. Invoking public policy scholar David Dery's concept of "papereality," the way in which record keeping allows "organizations [aspire to] engage in the construction and privileging of views of the world that become the world," Raman explains that streams of writing between India and Britain began as "the idealized solution to the problem of managing trust and reliability across a distance."[16] However, the intermediation of paper ended up distributing power to clerks and scribes. East India Company officials saw this as evidence of "native duplicity" rather than what it was: an inevitable consequence of documentary rule. Building on this scholarship, this article reflects critically on the source of administrative power and archival sources in colonial Algeria. It goes beyond recent attempts to disaggregate the colonial state to emphasize the disconnect that

existed between technologies of rule and the experience of rule, between the state's "papereal" perspective and the views of concerned villagers.[17]

The sources for this article relate to interwar vaccination campaigns in three *communes mixtes*: Aïn Temouchent and Tiaret in the department of Oran, and the *arrondissement* of Bougie in the department of Constantine (the *wilāya* of Bejaïa in the present day). Comparing sites has the advantage of focusing attention on aspects of the procedure that became standardized across Algerian territory, while drawing out differences in execution that resulted from the contours of local society and infrastructure, as well as differences attributable to the practices of individual vaccinators. I study the abovementioned logbook, lists, reports, expense claims, and other detritus of quotidian administration, as well as official correspondence, personnel files, Arabic- and French-language newspapers, and family histories. The archives of vaccination serve an entry point to understanding how medical auxiliaries administered smallpox vaccination in the *communes mixtes*: the kinds of training, labor, and clerical skills embodied in their work, and the accommodation and contestation of their presence by villagers—and by officials. At the same time, I consider how these documents formatted relations between the colonial state and its indigenous agents.

This research finds that vaccination was part and parcel of undergoing efforts to register and manage the colonized population of Algeria. The introduction of routine vaccination campaigns was enabled by the existence of the *état civil*, but there are signs that it also preceded and enabled the expansion of state registration in these areas. In this sense, the case of vaccination might seem to corroborate scholarship that sees interwar colonial bureaucracy as expanding and increasingly powerful.[18] However, there were limits to the institutional and social control that inhered in these forms of writing. Written accountability surrounding vaccination in interwar Algeria did not primarily serve to render disease and individual villagers legible to the state. Rather, it functioned to make medical auxiliaries visible to their administrative superiors. Since each vaccinator developed his own rationale and motives for performing vaccinations in the villages, the "papereal" and social worlds of vaccination were never entirely coterminous. As a "disciplining project," then, smallpox vaccination had more impact on these subaltern functionaries than it ever did on villagers. It is to these figures and their origins as vaccinators that the article now turns.

L'auxiliaire médical à l'école[19]

In metropolitan France, the *loi du 15 février 1902 relative à la protection de la santé publique* pronounced smallpox vaccination obligatory in the first, eleventh, and twenty-first years of life. For the most part, scholars of Third Republic welfare suggest that administration of vaccination in metropolitan France was "rudimentary" and "lax," with some notable exceptions.[20] In Algeria, the kinds of enforcement laid out by Governor-General Charles Jonnart in the 27 May 1907 decree on vaccination and revaccination were far more prescriptive than original metropolitan article. This legal instrument exceeded the French laws in three respects.

First, the 1907 decree criminalized variolation. Second, it required each and every inhabitant of Algeria, not only infants and youths, to be vaccinated within two years of the decree. Third, it formalized differences between populations in terms of race, geography, and gender. "European immigrants" were to be vaccinated immediately on their arrival in the port of Algiers by the *Services sanitaires*. Similarly, "native" workers travelling to the metropole would be subject to revaccination before departure.[21] "Europeans" and "natives" living in *communes de plein exercice* and *centres de colonisation* would encounter vaccination as they passed through the *mairie,* administrator's office, school, and army, or in the course of applying for a job in the civil administration. In contrast, for "natives" living "in the *douars* or the tribes" it was not the institutional pillars of the Republic but rather local "native" leaders appointed by the colonial state known as qaids and their subordinates, who would be responsible for enforcing vaccination. The decree further explained that doctors would vaccinate male "natives" in the *douars* whereas "native women are always vaccinated by midwives."[22] These divisions reflected assumptions about the enforcement mechanisms available to the state. They also reflected attitudes about gender, religious difference, and social order. The requirement of separate regimes for men and women in the *douars* betrayed the assumption that doctors were always male, and that Muslim villagers would refuse to allow doctors to minister to women on grounds of modesty.

The decree made no mention of vaccination services to be provided in the *douars* by Algeria's medical auxiliaries. Medical auxiliaries were excluded from the official decree on vaccination because of their anomalous position within the French medical profession. The category of "native" medical assistant became widespread throughout the French Empire at the turn of the century, as a way of transforming society through hygiene while preserving racial hierarchy and sparing colonial budgets from the burden of European doctors' salaries.[23] But the provinces of Algiers, Constantine, and Oran held the status of French departments. This meant that the medical auxiliarat created in Algeria on 14 September 1904 by Governor-General Jonnart came into direct conflict with the French *loi de 30 novembre 1892 sur l'exercice de la médecine et de la pharmacie* (applied to Algeria in 1896), which assured a professional monopoly on medical practice to holders of a medical degree from accredited French institutions. Theoretically, the *auxiliaire médical* was exempted from prosecution under the terms of the 1892 law by an imperial decree of 12 July 1851, which extended French licensing laws to Algeria but authorized Muslims and Jews to treat their coreligionists medically without requiring a license. However, officials were unwilling to test this principle, and advised Jonnart to avoid drawing attention to the issue, a practice followed by his successors.[24] This accounts for the fact that medical auxiliaries received no formal degree or transferable certification at the end of two years of study (extended to three years in 1934).[25] It also explains why instructions relating to their practice were only ever issued by administrative circular, such as a text dated 15 March 1907 that quietly expanded their practice to include vaccinations in anticipation of the passage of decrees relating to the 1902 law on public health.[26]

If medical auxiliaries occupied an uncertain legal status, their recruitment and training process exacerbated the professional and social ambiguity of their position.

Only Muslim men aged between nineteen and twenty-four who held the *Certificat d'études primaires* were eligible to join the *auxiliarat médical*, which made for a tiny recruitment pool.[27] Candidates with a dual education in both French and Arabic were placed at an advantage in the entrance examination, which privileged sons from families with a history of literacy and government service.[28] The small number of available training places further limited access to this opportunity: just over three hundred men were employed as medical auxiliaries in the period from 1904 until independence.

Despite administrative support for employing Muslim auxiliaries as vaccinators, students did not study smallpox or the benefits of vaccination. It was only in 1927 that this topic was added to the curriculum as part of a final-year module on infectious disease, along with instruction on "variolation: its dangers."[29] In the absence of concrete evidence, it is difficult to know why this was so. The curriculum was oriented heavily towards so-called "native diseases," namely venereal contagions, skin infections, and parasitic disease; "hygiene" also featured heavily on the program of study. Topics such as obstetrics and gynecology were excluded.[30] These pedagogical decisions reflected the imperative that medical auxiliaries not treat non-Muslims, and the belief that Muslim women patients would simply not tolerate their care. Still, trainees used the same anatomy amphitheater and cadavers in the *École de médecine* as European medical students after the latter's departure, and examined patients each morning during clinical rounds at the *Hôpital Mustapha Pacha* side-by-side with these students.[31] To compensate for their lack of formal instruction (in vaccination and other matters) auxiliaries received on-the-job training once they arrived at rural clinics. Some borrowed medical textbooks from the *médecin de colonisation*, and subscribed to French scientific journals to develop their medical knowledge.[32]

Technical and social selection in combination with individual ambition and the experience of their studies encouraged medical auxiliaries to think of themselves as trainee doctors.[33] Consequently, the conditions of their employment under *médecins de colonisation* in infirmaries in the *communes mixtes* turned out to be a disappointment, particularly the modicity of their remuneration. In 1907 the entry-level salary for an *auxiliaire médical* was 1000F per annum, compared with 3000F for the *médecin de colonisation*. By 1927 auxiliaries' standing had improved somewhat relative to doctors', since the entry salaries had increased to 3,000F and 11,500F respectively.[34] But although the salary was prodigious in comparison to the poverty of villagers in the *douars*, for many medical auxiliaries it was insufficient to cover the costs of accommodation and supporting an extended family.[35] As a later section will show, this created a pecuniary incentive to carry out smallpox vaccinations, which were remunerated with honoraria.

Administrative regulations and treatment at the hands of auxiliaries' immediate superiors, the *médecin de colonisation* and the administrator in *communes mixtes*, also proved frustrating. In theory, auxiliaries' sphere of practice was restricted to working in infirmaries under the supervision of a *médecin de colonisation*, which stood in the way of their conducting vaccination campaigns; an auxiliary entering the *douars* unaccompanied faced instant dismissal, or at least the loss of a month's wages.[36] Yet documentation from the *communes mixtes* makes clear that some medical auxiliaries

were invited to perform smallpox vaccinations with the consent of administrators and doctors on an ad-hoc basis.[37] Why were some medical auxiliaries routinely called upon to perform smallpox vaccinations, while others were prohibited from doing so?

"Un corps approprié à l'Algérie"?

Prior to WW1, Algeria's compulsory vaccination campaigns had been limited in scope. Insufficient vaccine supplies, personnel, and problems of logistics hindered application of the 1907 decree outside of major settlements.[38] The vaccination service, already restricted, was derailed as a consequence of medical mobilization. Then after the armistice came disaster: heavy rains in the spring of 1919 and the driest growing season on record in 1919-20 resulted in failed harvests; local authorities resisted work-welfare measures being urged by the government in Paris; famine conditions and outbreaks of disease resulted.[39] Whereas there had been only four recorded cases of smallpox in the department of Algiers before the war, there were 602 cases in 1921 and 156 in 1922.[40] This led to renewed effort to vaccinate rural populations biannually, in the spring and winter.[41]

Medical auxiliaries were increasingly enlisted for the task of performing vaccinations in the *douars*, but not all officials welcomed their involvement. From 1921, the prefect of Algiers not only gave medical auxiliaries authorization to vaccinate independently, but also allocated them vaccination honoraria and payment of associated travel expenses: from 1921, these were fixed at 0.10F per vaccination, a daily travel allowance of 0.15F, and a distance rate of 0.50F per kilometer;[42] in 1927, the rates increased to 0.25F, 20F, and 1.50F respectively.[43] The Muslim auxiliaries in this department even vaccinated settler populations, despite the fact that they were not supposed to treat Europeans and their salaries were funded by taxes levied on the Muslim population.[44] The authorities also had resort to these agents to supplement missionary and military efforts in the *Territoires du Sud*, for which medical auxiliaries received an honoraria half of that allocated in Algiers.[45] The situation in Algiers and the *territoires du Sud* contrasted with that in the departments of Constantine and Oran, where prefects restricted vaccination work to doctors and midwives (although mayors or administrators were able to circumvent this at their request).[46] Subsequently, the prefect of Constantine, but not Oran, allowed auxiliaries to claim vaccination honoraria as they did in Algiers.[47]

These officials and some physicians objected to the medical auxiliary taking part in vaccination on the grounds that the male medic deterred already refractory populations from submitting to vaccination. A bilingual hygiene instruction manual produced by the *Institut Pasteur d'Algérie* in 1922, *Kitāb al-Ṣiḥḥa* (The Book of Health), captures something of this attitude. The manual was distributed to every qaid in the *douars*, with the intention that he should learn the signs of human and animal diseases and the hygienic principles by which to avoid them, and communicate these to village elders. The Arabic-language text adopted a peremptory tone when discussing *al-jadarī* (smallpox):

> Today we have a beneficial and effective means of driving smallpox. It is that which is termed by vaccination [*talqīḥ*] of smallpox, and it is inoculation [*faṣd,* literally, the opening of a vein]. Sanitary laws impose it definitively for people of one year of age and 11 and 21 years, so that whomsoever disobeys these laws and does not adhere to them that should have been subject to it [vaccination], out of ignorance or forgetfulness or lassitude will receive punishment.[48]

The assumption spelled out in these materials was that villagers were deliberately evading smallpox vaccination. The blame for this was typically laid at the door of Islamic and customary codes of modesty and segregation of the sexes.

"Local *moeurs*" were invariably invoked to explain the origins of smallpox outbreaks. A case in point is the official account of a 1925 epidemic that resulted in 48 smallpox deaths in the department of Oran and 1,018 in the department of Constantine. Lucien Raynaud, a prominent Pasteurian and hygienist, produced data that linked that year's mortality rates to a particularly virulent strain of the smallpox virus and to an influx of refugees from the Rif war in Morocco.[49] Raynaud disseminated this information in the *Bulletin sanitaire de l'Algérie*, which circulated to every *médecin de colonisation* in Algeria (but took so long to reach recipients in the interior that the sanitary information it contained often arrived too late to be actionable). Yet the text accompanying the statistics expressed the view that women's avoidance of vaccination and the continued practice of variolation were to blame for the epidemic. Raynaud also stressed the impropriety of using the *auxiliary médical* to vaccinate:

> Whatever the qualities of this auxiliary may be, he cannot penetrate in the women's quarters; sent to vaccinate among the tribes, alone or accompanied by a single horseman from the commune mixte, he has no authority; he is only shown children and a few elders, always the same ones. He may not vaccinate any woman, any young girl. [...] Little by little the number of natives who have not acquired immunity or that have lost it increases, and whether a smallpox infection occurs in these surroundings or an operator carries out a smallpox vaccination, the evil spreads.[50]

Explanations rooted in Islam also provided a mask for the technical failings of the vaccine service. The most serious smallpox epidemic of the interwar period occurred 1927, affecting an estimated 4,366 people, 3,176 in Oran alone. In the *commune mixte* of Aïn Témouchent an entire generation of babies and infants was lost to the disease. The *médecin de colonisation* informed *Directeur départemental de la Santé publique* for Oran Albert Brégeat that, "The last vaccine sent by the Institut Pasteur had no efficacy. The young vaccinated during the last tour showed no sign of a reaction when they were followed up."[51] Brégeat passed this intelligence on to the prefect of Oran, but his own writings in the *Bulletin sanitaire* blamed women and children, adhering to the trope that they were "never vaccinated," thereby forming a reservoir for transmission of the virus.[52] In 1930, scientific researchers at the *Institut Pasteur d'Algérie* judged that the 1927 outbreak had, in fact, been caused by deficiencies in the quality of the vaccine used that year, and also noted that duration of protection offered by the vaccine was much shorter than the ten-year interval required by law.[53] This discovery did nothing to overturn the persistent association between women and avoidance of vaccination.

Officials and physicians either accused Muslim women of going from home to home to conduct variolation, thereby increasing the spread of the disease; or reproached them for cloistering themselves out of sight, avoiding vaccination both for themselves and their children, thereby reducing the level of protection in the population.

Was there any basis in truth to the claim that medical auxiliaries deterred women and children from attending vaccinations? Governor-General Maurice Viollette believed there was, and attempted to reorganize medical assistance for rural Muslims along the lines of gender.[54] In 1926 Viollette authorized the creation of a new category of health worker, the *infirmière visiteuse coloniale* (henceforth IVC). The same year, Viollette also ordered the creation of mother and baby services, the *Assistance aux mères et aux nourrissons*, although it was not until 1934 that *conseils municipaux* moved to establish these consultations in notable number.[55] In 1932, Governor General Henri Carde (1930-35) ordered medical auxiliaries to focus their efforts on Algerian (male) notables. Gendered health formations were a new weapon in the colonial state's ongoing struggle to control rural society, targeting populations to which medical auxiliaires supposedly had no access. However, it is revealing that in the early phase of the *assistance aux mères et aux nourrisson*s, medical auxiliaries often performed the consultations—for which they were allegedly unsuited—because of the small number of trained IVCs.[56]

Medical auxiliaries rushed to deny the charge that it was inappropriate for them to treat women. The leadership of the auxiliary professional association established in 1923, the *Association amicale des auxiliaires médicaux d'Algérie*, appealed to be designated Algeria's official "vaccinating agent" and to receive direct payment for vaccinations, without success.[57] A number of medical auxiliaries sent policy suggestions to the governor-general and other high-ranking officials, in which they claimed sole cultural authority over Muslim women. Echoing the urban political struggles of the *Jeunes algériens* and their interwar successors the *Fédération des élus indigènes* to assert themselves as the privileged interlocutor between Muslims and the French colonial state, auxiliaries presented themselves as "un corps approprié à l'Algérie."[58]

For example, in 1932 Amokrane Ould Amer explained verbally and in writing to the *Inspecteur général de la Santé publique* that, "[Prejudices] have disappeared for the majority if not the totality. I am speaking of the native woman not wishing to let herself be examined and treated by the medical auxiliary. It is incorrect to think this, because they let themselves be treated quite readily nowadays."[59] Ould Amer's report not only refuted official concerns about vaccination and gender propriety, it also inverted them by claiming that the IVC was unsuited to the work of vaccination precisely because of *her* gender. First, Ould Amer explained that the IVC was not physically capable of the task of touring the *douars* on horseback all day, several times per week.[60] Second, he implied that it was not the male medical auxiliary who upset local gender norms by examining women, but rather the IVC, an unmarried woman who traipsed about the countryside entirely unchaperoned.[61] The evidence of a handful of personnel files seems to vindicate Ould Amer's insinuations. IVCs seem to have been trailed by scandal, not necessarily through any fault of their own: when nurses received male patients in their homes, were suspected of courting a Muslim, or even talked to married men, European and Muslim villagers alike were in high dudgeon.[62] French officials understood Islamic

rules on gender to be the central moral problem of Algerian society, but, as it transpired, this was hardly unique to Islam.

Another *auxiliaire médical*, Ben Smaïl Sahraoui, sent the governor-general an essay which he also published, entitled "Exécuteur et éducateur: voilà le rôle de l'auxiliaire médical." Sahraoui's text disregarded Carde's command to medical auxiliaries to prioritize male notables, instead making women and children in the *douars* the specific concern of his profession. Saharaoui's text discussed instructions to give mothers on neonatal resuscitation, infant bathing, feeding patterns, weaning, and the proper care of infections, including the importance of vaccinations. Since the topics of obstetrics and puericulture were nowhere included on the curriculum of the *auxiliaire médical*, Saharaoui must have obtained the information on his own initiative.[63]

Although we should not discount the friction that could exist between the medical auxiliary and the IVC, there is a clear sense in which the opposition of these agents to the IVC was strategic and rhetorical.[64] Personnel files and anecdotal evidence attest that medical auxiliaries and IVCs vaccinated side by side, and that warm friendships could exist between the two colleagues. (When Amokrane Ould Amer penned his report in 1932 he had no experience of working with an IVC, but was in fact second-in-command to a female physician with whom he had an excellent working relationship.) However, in their communications with officials, medical auxiliaries depicted vaccination and public health work in the *douars* as masculine pursuits suited only to the male auxiliary. The president of the *Association amicale* described himself and colleagues to Governor-General Viollette in phallic terms: as "a penetrating organ" responsible for "the penetration of civilization in native country."[65] The letter continued,

> The role of the medical auxiliary in the public [medical] service […] often erased (in Algeria, unfortunately, it is personalities who dominate) continues nonetheless reliably and effectively. Perhaps you will not find official trace of it, but it would be easy to gather testimonies among European and native populations who see us at work and who enjoy our care and our devotion in their farms or in their *mechtas* [villages] lost in the *bled*, far from the center, far from the doctor.[66]

Medical auxiliaries appropriated the gendered rhetoric of colonial conquest to emphasize that they were best suited linguistically, culturally, and physically to bring vaccination and other scientific advances to the *douars.* More to the point, they were willing to perform a difficult mission to help their "coreligionists" and Europeans: a mission that few medics were prepared to undertake.
They hoped thereby to gain recognition, and to achieve improvements to their professional standing and material circumstances.

"L'auxiliaire médical en face de sa tâche"

Ould Amer was not wrong to describe vaccination as a physically demanding activity. Extant itineraries of vaccinators show weeks of early departures and hard travel by pack animal and foot.[67] A travel itinerary submitted by Driss Meliani in 1927 recorded that he visited as many as five *douars* in Tiaret in a single day, leaving his home early to

begin vaccinating at 7.30am and continuing until after 6.00pm.[68] Numerous vaccination points needed to be visited in a single day, and the dispersal of settlements imposed long hours on mule or packhorse. For example, in October 1936, Abbas Rahal spent nineteen days in the region of El-Milia, travelling 1,084 kilometres on horseback to vaccinate only 6,889 people.[69] Dismounting and remounting a pack animal throughout the day added to the exhaustion and soreness of travel, because in the interwar period motorized transport was not widely available to healthworkers or even feasible because of the poor quality and negligible quantity of roads in the *communes mixtes*.[70] The tracks between vaccination points could be treacherous. A *feuille signalétique* for Idir ben Tahar Zarouri records that he acquired a permanent limp after fracturing his femur during a fall during a vaccination mission in the hills around Collo in 1926.[71] Ten years later, Abdelqader Benlabiod died of typhus contracted during a vaccination tour of the *douar*s in the *commune mixte* of La Séfia.[72]

Surviving itineraries and mileage expense forms filed by medical auxiliaries allow us to quantify the experience of vaccination for its agents as time in the saddle. By following the "paper technologies"[73] associated with vaccination, we see that the contributions of this agent to vaccination were not limited simply to its delivery, but also included the aspect of its documentation. Given that vaccination paperwork was regularly completed in the hand of the medical auxiliary, we can safely suggest that much of the simple bureaucracy around the procedure in the *Communes mixtes* was made possible by the existence of these secondary personnel and their scribal skills.

Records from Aïn Temouchent provide one concrete instance of how vaccination rounds in the *douars* were planned in the 1930s. The administrator ordered the qaid, his subordinate the *adjoint indigène*, or medical auxiliary to produce lists of names of children and young people subject to vaccination and revaccination.[74] The administrator dispatched a copy of the lists to the prefecture for verification, along with an order for the requisite quantity of vaccine.[75] Once vaccination was underway, the vaccinator compiled a logbook assigning a number to each vaccinated subject, and listing family name, first name, and age of vaccinated and revaccinated children, adults, and elders. The names could then be compared with the initial lists and recorded at the prefecture. Registration of births and deaths in the *douars* was declared obligatory in 1930 and 1934; it is conceivable that the mobilization of information about individuals during the planning of vaccination encouraged and consolidated emergent registration.[76]

Another form of paperwork regularly completed by the medical auxiliary was the *rapport général* (general report), which detailed the results of each cycle of vaccination. A standardized form printed in Blida was introduced in the 1920s, but seems to have been retained more systematically from the 1930s.[77] The form included a column recording "success" and "failure" rates, as well as the batch number for the vaccine. A set of reports from the *arrondissement* of Bougie dating to the 1930s record dramatic variations in the "success" rate of different batches of vaccine, ranging from 84.6% to 96.7% for first-time vaccinees, whose reactions were the most vigorous, to 21.6% to 74% for revaccinees, and 13.8% to 44% for voluntary vaccinees.[78] These results are not helpful for telling us how much protection was actually being conferred—

vaccinators recorded a skin reaction as a sign of "success" and the lack of a reaction as a "failure," whereas public health experts today would consider a lack of reaction in revaccinated subjects to be an indication of *immunity*—but they do tell us administrators and technicians at the Institut Pasteur were concerned with this question. The inclusion of vaccination data traceable to a specific batch number meant that the paperwork, if completed accurately, had the potential to be utilized to conduct quality control of vaccine production. Unfortunately, this section of the form was not always completed.

A final paper technology of vaccination was the columnar worksheet for expense claims, usually drafted by hand. This worksheet included information on the places and dates of vaccination sessions, numbers of kilometers travelled and vaccinations performed, with fees expressed as the sum of distance allowances and honoraria. The sums involved could be significant. For example, in 1936, Mouloud Bouhidel in Khenchela and M'hammed Ben Jeddou in Morris, both 1st class medical auxiliaries, were owed 1,003.50F and 1,147.25F respectively for their vaccination work, representing approximately six per cent of their annual salary of 17,200F.[79] The accumulated sums were far more significant for lower ranks: in the same year, Abbas Rahal, 6th class, in El-Milia, was owed 1,855.25F for vaccinations in the month of October alone, representing 16.1 per cent of his salary.[80]

While name lists, vaccination logbooks, and reports held administrative and scientific utility, the expense worksheet served a managerial purpose. In order for payment of honoraria to be cleared, the worksheet had to be signed by the medical auxiliary, approved by the *médecin de colonisation*, and corroborated by the administrator.[81] It was not uncommon for the administrator to query the sums involved. For instance, the administrator for La Sédrata contested a claim form submitted by Lahoussine Dib, on the grounds that, "[I]t is physically impossible [for him] to have carried out this work properly in three days, in view of the distances, dispersion of the population and the number of stops."[82] The expense worksheet was a means to assert control over medical auxiliaries who travelled solo in the *douars*, by verifying that this agent was carrying out his assigned duties and not presenting false expense claims. Medical auxiliaries created a basic bureaucracy around vaccination, which contributed to registering populations and was marginally successful at quantifying their protection against disease. In turn, this very bureaucracy policed them.

"Je ne lui connaît pas d'amis dans la region"[83]

Thus far, the article has considered relationships between colonial administrators and medical auxiliaries, with little regard for the villagers who were the targets of vaccination. Villagers' perspectives are difficult to access in the colonial archives; even non-official sources such as the press and family histories represent villagers from the point of view of a scribe, journalist, or functionary. However, it is possible to draw some general conclusions. These sources suggest that where smallpox vaccination was most efficacious this was not solely the result of administrative finesse or financial

incentives, but also depended on vaccinators' abilities to mobilize local networks of authority and friendship.

Mohamed Amrane of the vaccination logbook spent almost the entirety of his career as medical auxiliary in Akbou, Kabylia, where he raised seven children. The Amrane family hailed from Fort National and was considered "very devoted to the French cause since [the French] arrival."[84] Amrane's paternal uncle Rabah and his paternal cousin Mohand occupied in succession the post of qaid in *douar* Beni Bouchaïb, *commune mixte* Haut Sebaou. Amrane and his wife were so deeply embedded in the community of Akbou that when he was offered the highly sought-after post of Blida in 1934, he turned it down.[85] His logbook suggests that avoidance of vaccination by women was not typical of all times and places, if indeed it continued to occur in some regions.[86] The fact that Amrane had been touring the hills surrounding Akbou for almost three decades no doubt helped his efforts.

Local networks and connections were helpful in other ways. Chérif Bachir became medical auxiliary for Fort National in Kabylia in 1920. Bachir was reputedly descended from a saintly family in Fort National. During vaccination rounds and medical missions, he stayed with the schoolmaster in Agouni-Khelil, who was a close friend, allowing him to save on expenses.[87] The schoolmaster happened to be regional correspondent for *L'Echo d'Alger* in Fort National. In June 1939, *L'Echo d'Alger* published a paragraph praising Bachir for vaccinating more than 4,000 people in Beni Douala/At Dwala in a single campaign;[88] another article lauded "this precious medical auxiliary who does not stint on effort to haul himself as far as the most remote douars, not only in the vaccination period, but also when his science is called for."[89] The fact that ties of kinship, belief, and friendship bound Bachir to the people he vaccinated—and, more importantly, to the journalist who captured these interactions—must have been a factor in his success.

Mohamed Amrane and Chérif Bachir were both Berber-speakers who received postings near their home regions in Kabylia. This was atypical. Colonial officials were ever fearful of the advent of solidarities that might threaten settler interests, and so sought to curb them at all costs. They also feared that medical auxiliaries would be tempted to practice medicine "illegally" if they were posted to an area where they had family connections. The very attributes that could have supported the goals of compulsory vaccination were thereby perceived as inauspicious.[90] Except in cases where the language barrier was an issue, medical auxiliaries were usually distanced from their home regions deliberately. One of the consequences of this policy is dramatized by a police report.

Early in November 1923, a smallpox vaccination campaign among the villagers of Hranfa in northwestern Algeria erupted into a public melee. At the center of the dispute were the medical auxiliary Belkacem Hili and the *fellah* (peasant) "Kacem" Mohammed Bel Adj, whom the qaid had charged with bringing children from neighboring *douars* to be vaccinated at nine in the morning. In a statement to the nearest European representative of French authority, the administrator of the *commune mixte* of Ténès, Hili claimed that villagers had kept him waiting for ninety minutes before showing up to be vaccinated. When Hili complained to Bel Adj, the *fellah* insulted him

and menaced him with a club. Only the intervention of the assistant *qaid* saved Hili from injury and allowed him to vaccinate the young villagers. But witnesses, all but one of whom were relatives of Bel Adj, maintained that it was the medical auxiliary who had kept the children of the village waiting in the cold and rain. They also agreed that Bel Adj was not the aggressor; rather it was Hili who had called Bel Adj a *"fils de chien, beni kalb* [son of a dog]" before striking him with a cane. The *nāʿib*, also a relative of Bel Adj, verified this version of events, adding, "The official generally treats his compatriots with contempt, and also I don't know of his having friends in the region."[91]

Both parties' defense turned on the hands of the clock. Hili maintained that the villagers had kept him waiting for an hour and a half, which made an already difficult task insupportable. Hili was war-disabled in WW1; he was unable to walk without the support of a cane and suffered from limited vision and severe headaches that he described as "unbearable."[92] (Hili died abruptly before officials could pass verdict on the incident in Hranfa).[93] However, the villagers also had a point. In order to attend the vaccination session, the young people of Hranfa had walked or been carried long distances across difficult terrain, only to wait in the rain, and timely attendance at vaccination sessions must have been very difficult in the *douar*s, where people were too poor to afford shoes, let alone a timepiece.

Conclusions

Historians of disease and empire have found smallpox and vaccination campaigns to be a productive site of analysis for thinking about the coercive power of the colonial state and colonized resistance.[94] This study contributes to our understanding of how disease management formed part of emerging technologies of colonial rule in Algeria, in the *communes mixtes* during the interwar decades. By carefully examining the documentary practices around vaccination in colonial Algeria, we appreciate that the expansion of the bureaucratic state created new epistemic practices around public health as well as a material culture of bureaucracy that increasingly brought the state down to the local level. The practice of keeping name and age lists implied a commitment to following children at the ages of one, eleven, and twenty-one years, even if this pledge was never realized. The filling and filing of reports afforded the possibility for vaccine quality control. Smallpox vaccination brought about the potential for new, routine interactions between the colonial state and local society, through the mediation of vaccinators, vaccine, and paperwork.

This study has reserved judgment on the immunological and demographic outcomes of interwar vaccination campaigns in Algeria. These are impossible to evaluate for a number of reasons. First, statistical evidence from the period is incomplete and extant data cannot be evaluated without knowledge of the methods used to collect it. Second, disparate results were the consequence of imponderables: pre-existing immunity, storage conditions, quality and administration of the vaccine, as well as the length of time between vaccination and follow-up. Only exposure to contagion was proof of a successful vaccination, yet even the vaccinated were vulnerable to infection. Finally, smallpox vaccination has been considered here in isolation from other diseases. Elsewhere I show that the system of vaccination honoraria

simultaneously encouraged vaccination work and reduced the feasibility of other medical interventions because of a ceiling on disbursements.[95] In official terms, public health became oriented towards a bi-annual health intervention, while little else was done to alter the myriad, pressing challenges to health, food insecurity, poor sanitation, and lack of infrastructure with which rural populations contended on a daily basis.

There is no doubt that vaccination was very significant for one group: Algeria's medical auxiliaries. This healthworker became one of the lynchpins of mass smallpox vaccination. Outside "the world that become the world" of paperwork, vaccination was experienced as a form of heroism by many medical auxiliaries. M'hamed Kouadri expressed his enthusiasm for vaccination in sonnet form in a poem titled "To Immortality." In its closing lines of the sestet, Kouadri championed the labour of the humble vaccinator:

> If he dies, he may leave a vaccine, a source,
> A treasure of light, where upon his brow immortality
> Will write: Come that I may enlighten you![96]

For Kouadri the vaccine was a precious gift of enlightenment to be shared with all humanity as well as a route to professional fulfillment. Even for the less poetically inclined, vaccination formed and enduring memory for these workers and their descendants.[97]

Vaccination also formed a vital supplement to auxiliaries' meager salaries. Precisely because vaccination was easily quantifiable and remunerated by means of honoraria it became the rationale for building and reinforcing a basic bureaucracy to encompass the *douars,* since vaccination paperwork was regularly completed in their hand. However, we should not give too much credence to the "papereality" of administration. Given the shortage of resources and personnel, the law on smallpox vaccination was neither comprehensively nor effectively applied. Medical auxiliaries, villagers, and least of all the smallpox virus were never entirely under state control. Ultimately, the administrative bureaucracy generated by vaccination was more about supervising the medical auxiliary and verifying that he was indeed travelling the kilometers for which he claimed, than it was about disciplining society or controlling disease.

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[1] See Christine Mussard, "La commune mixte: l'espace d'une rencontre," in *Histoire de l'Algérie à la période coloniale, 1830-1962*, ed. Abderrahmane Bouchène, Jean-Pierre Peyroulou, Ouanassa Siari Tengour, and Sylvie Thénault (Algiers: Barzakh, 2012).
[2] See Jennifer Johnson, *The Battle for Algeria: Sovereignty, Health Care, and Humanitarianism* (Philadelphia, PA: University of Pennsylvania Press, 2015).
[3] On the etiology of smallpox, see Alison Bashford, *Imperial Hygiene: A Critical History of Colonialism, Nationalism and Public Health* (London: Palgrave Macmillan, 2004), ch. 1.
[4] Mohamed Ben Larbey Seguir, *La Médecine arabe en Algérie* (Paris: A. Davy, 1884), 39-41.

[5] Historical studies of Jenner's discovery are legion. See for example, Anne-Marie Moulin, *L'aventure de la vaccination* (Paris: Fayard, 1996).
[6] See Yvonne Turin, *Affrontements culturels dans l'Algérie colonial. Ecoles, Médecines et Religion, 1830-1880* (Paris: François Maspero, 1971).
[7] Paulin Trolard, "Hygiène algérienne. Des mesures à prendre pour propager la vaccine en territoire indigène," *Le Bulletin médical de l'Algérie*, 4 (1900), 113-119, quotation on 113.
[8] The *Commune de plein exercice* was comparable in size and organisation to the French *commune*, and governed by an elected mayor and municipal councils. *Communes de plein exercice* also comprised mixed populations of "Europeans," and Algerian Jews and Muslims.
[9] See Kjell Halvorsen, "Colonial Transformation of Agrarian Society in Algeria," *Journal of Peace Research*, 15, 4 (1978), 323-343; Kamel Kateb, *Européens, "indigènes" et juifs en Algérie (1830-1962), représentations et réalités des populations* (Algiers: INED, 2001); Michel Laynay, *Paysans algériens. La terre, la vigne, et les hommes* (Paris: Seuil, 1963); Djilali Sari, *La depossession des fellahs (1830-1962)* (Réghaïa: ENAG, 2010); Tony Smith, "Muslim Impoverishment in Colonial Algeria," *Revue de l'Occident Musulman et de La Méditerranée* 17, 1 (1974), 139–62.
[10] *Département d'Alger. Hygiène publique année 1910. Rapport général sur les vaccinations. Rapport général sur les Epidémies. Rapport general sur les travaux du Conseil départemental d'hygiène* (Algiers: Imprimerie administrative Victor Heintz, 1911).
[11] Centre des archives d'Outre-mer, France (henceforth FR ANOM) ALG GGA 8X/186, "Rapport no. 3. Programme de lutte contre la variole" [1935].
[12] *Annuaire des Services et du Personnel (arrêté au 30 Avril 1934)* (Algiers: Imprimerie La Typo-Litho et Jules Carbonel réunies, 1934). This corroborates observation that non-European auxiliaries outnumbered European practitioners of western medicine in Africa. See Heather Bell, *Frontiers of Medicine in the Anglo-Egyptian Sudan, 1899-1940* (Oxford: Clarendon Press, 1999), 2. For an account of the origins of medical assistance for Muslims, see Hannah-Louise Clark, "Expressing Entitlement in Colonial Algeria: Villagers, Medical Doctors, and the State," *International Journal of Middle East Studies* (forthcoming).
[13] "Office International d'Hygiène Publique. Études sur la technique de la vaccination antivariolique," *Le Bulletin sanitaire de l'Algérie*, 391 (June 1930), 193-4.
[14] Max Weber, *Economy and Society: An Outline of Interpretive Sociology* (Berkeley, CA: University of California Press, 1978 [1922]), 219.
[15] See Bruno Latour, "Visualization and Cognition: Drawing Things Together," in Michael Lynch and Steve Woolgar (eds.), *Representation in Scientific Practice* (Cambridge, MA: The MIT Press, 1990); Anke te Heesen, in "The Notebook: A Paper-Technology," in Bruno Latour and P. Weibel (eds.) *Making Things Public. Atmospheres of Democracy* (Cambridge, MA: MIT Press, 2005), 582-589; Ann Laura Stoler, "Colonial Archives and the Arts of Governance: On the Content in the Form," in Francis X. Blouin, Jr., and William Rosenberg, eds., *Archives Documentation and Institutions of Social Memory: Essays from the Saywer Symposium* (Ann Arbor, MI: University of Michigan Press, 2006), 267-79; George Steinmetz, *The Devil's Handwriting: Precoloniality and the German Colonial State in*

Qingdao, Samoa, and Southwest Africa, Chicago Studies in Practices of Meaning (Chicago: University of Chicago Press, 2007); Ben Kafka, *The Demon of Writing: Powers and Failures of Paperwork* (Cambridge, MA: Zone Books, 2012); Bhavani Raman, *Document Raj: Writing and Scribes in Early Colonial South India* (Chicago: University of Chicago Press, 2012); Matthew Hull, *Government of Paper: The Materiality of Bureaucracy in Urban Pakistan* (Berkeley, CA: University of California Press, 2012).

[16] Raman, *Document Raj,* 2-3.

[17] See for example Peter Zinoman, *The Colonial Bastille: A History of Imprisonment in Vietnam, 1862-1940* (Berkeley, CA: University of California Press, 2001); John L. Comaroff, "Reflections on the Colonial State, in South Africa and Elsewhere: Factions, Fragments, Facts and Fictions," *Social Identities: Journal for the Study of Race, Nation and Culture*, 4.3, 321-61.

[18] See Crawford Young, *The African Colonial State in Comparative Perspective* (Yale, CT: Yale University Press, 1994); Christophe Bonneuil, "Development as Experiment: Science and State Building in Late Colonial and Postcolonial Africa, 1930-1970," *Osiris* 15 (2000), 258-81.

[19] This and two subsequent headings are direct quotations from a report by the medical auxiliary Amokrane Ould Amer. Archives Nationales d'Algérie, Algiers (henceforth ANA) DZ/AN/17E/1094, "Notes sur l'assistance médicale en Algérie à M. l'Inspecteur Général « LASNET »," 24 August 1932.

[20] Historians of Third Republic welfare emphasize the obstacles to centralized hygiene and public health measures presented by local prefects, business interests, and physicians. However, there is evidence that authorities could interpret the 1902 vaccination law in ways that were highly intrusive and effective. Peter Baldwin gives the example of Marseilles, where the smallpox rates were the highest in France (Algeria included). Authorities responded to an epidemic in 1913 by sending vaccinators door-to-door in working-class neighborhoods, thought to be the source of pollution for the rest of the city. See Peter Baldwin, *Contagion and the State in Europe, 1830-1930* (Cambridge: Cambridge University Press, 1999), 266; Pierre Darmon, *La Longue traque de la variole: les pionniers de la médecine préventive* (Paris: Librairie académique Perrin, 1986); Lion Murard and Patrick Zylberman, *L'hygiène dans la République: la santé publique en France, ou l'utopie contrariée, 1870-1918* (Paris: Librairie Arthème Fayard, 1996), especially chapter XII; Matthew Ramsey, "Public health in France," in Dorothy Porter (ed.), *Health, Civilization and the State: A History of Public Health from Ancient to Modern Times* (London: Routledge, 1999), 45-118.

[21] See the section on "Départ pour la Métropole d'Ouvriers Indigènes," in the *Bulletin sanitaire de l'Algérie*.

[22] *Ibid.*

[23] See Laurence Monnais, "Paradoxes d'une médicalisation coloniale," *Actes de la recherche en sciences sociales* nº 143, no. 3 (June 1, 2002), 36–43; Jean-Paul Bado, *Les conquêtes de la médecine moderne en Afrique* (Paris: Éd. Karthala, 2006); Benoït Gaumer, *L'organisation sanitaire en Tunisie sous le Protectorat français (1881-1956): un bilan ambigu et contrasté* (Québec: Les Presses de l'Université Laval, 2006); Sokhieng Au, *Mixed*

Medicines: Health and Culture in French Colonial Cambodia (Chicago: University of Chicago Press, 2011); Hannah-Louise Clark, "Doctoring the *Bled*: Medical Auxiliaries and the Administration of Rural Life in Colonial Algeria, 1904-1954" (PhD dissertation, Princeton University, 2014).

[24] ANA Territoires du Sud (henceforth TDS) 0531, Letter Charles Jeanmaire to Governor-General, 20 October 1904.

[25] *Arrêté du 3 octobre 1934 fixant le statut des adjoints techniques indigenes de la santé publique*.

[26] ANA TDS 0531, 'Extraits du rapport de M. le Professeur Bouchard,' 71-72.

[27] For example, only 0.75 per cent of Muslims of secondary school age were engaged in education in 1954, after sixty years of Republican educational policies. Figure from Charles Robert Ageron, *Les Algériens musulmans et la France (1871-1919)* (Paris: Presses universitaires de France, 1968). See also Fanny Colonna, "Training the National Elites in Colonial Algeria 1920-1954" in *Historical Social Research/Historische Sozialforschung* 33.124 (2008), 285-295.

[28] The origins of the *auxiliarat* and social backgrounds and training of recruits are explored in detail in Clark, "Doctoring the *Bled*."

[29] ANA TDS 101, Aubry, Soulié, Mirante, "Procès-verbal de la commission de réforme des programmes des cours et du statut des auxiliaires médicaux," 20 July 1927.

[30] ANA TDS 0531, Soulié, "Programme."

[31] ANA TDS 0531, "École de Médecine et de Pharmacie d'Alger. Assemblée du 22 Nov 1904. Extrait du procès-verbal," November 22, 1904.

[32] ANA TDS 0531, Questionnaire, Barbé, Médéa, undated [1911].

[33] Clark, "Doctoring the *Bled*," 80-85.

[34] ANA TDS 0531, "Avis," 29 June 1906 and Chikh & Khider catalogue (henceforth CK) 78, Réglementation et ancienne réglementation, letter 28 September 1927; Meinard, "Lettre au Gouverneur General," *Bulletin du Syndicat professionnel des médecins de colonisation d'Algérie* 10.34 (April 1928), 7.

[35] As one Arab delegate in the *Délégations financières algériennes* said of *auxiliaires médicaux*, "These are poor folk." René Foudil, speaking on 3 June 1936. See *Délégations financières algériennes* (Algiers: Imprimerie officielle, 1936), 151.

[36] ANA TDS 0531, "Avis," undated; circulars dated 29 June 1906, 15 March 1907, and 27 August 1907.

[37] ANA TDS 0531, letter from Prefect of Algiers to Governor-General, 26 October 1907; letter Administrator Commune mixte Djendel to Prefect of Algiers, 1 May 1907; and questionnaires. Some doctors were unaware of the official guidelines; see Dr Morin, Khenchela, 3 May 1911.

[38] FR ANOM ALG GGA 8X/186, "Rapport no. 3 (3)," 3. It has not been possible to locate figures that break down the distribution of vaccination by *commune de plein exercice* and *commune mixte* in the north, and *territoires indigènes* in the south. FR ANOM Tiaret, circular 31 October 1927 states that European settlements were prioritized when vaccine was distributed during epidemics.

[39] Clark, "Doctoring the *Bled*," 151-8.

[40] Increased rates of smallpox went along with a surge in exanthematic typhus. 6,113 cases of typhus were recorded between 1 October 1920 and 1 July 1921, and 1,106 cases between 1 October 1921 and 1 July 1922, resulting in a total of 1462 deaths. Actual figures are unknown, since families were reluctant to subject a sick person, or even a corpse, to a doctor or authority-figure for investigation; the authorities were unwilling to alarm tourists, foreign consuls and merchants with alarming statistics; and ultimately, there were too few medical personnel on hand to record morbidity and mortality with any accuracy. Lucien Raynaud, "Rapport sur l'état sanitaire de l'Algérie," *Bulletin sanitaire de l'Algérie* 300 (15 July 1922), 155-153.
[41] This timing avoided the hottest months from May to October when the vaccine spoiled. Sessions were also scheduled to avoid the most labour-intensive periods of the agricultural year. Paulin Trolard, "Hygiène algérienne," 119.
[42] "Arrêté 10 novembre 1921," *Le Bulletin sanitaire de l'Algérie*, 294 (15 January 1922).
[43] "Indemnités de vaccination," *Le Bulletin sanitaire de l'Algérie*, 351 (15 February 1927), 30.
[44] ANA, TDS 0438, letter Massonet, 25 August 1922.
[45] ANA, TDS 0438, letter Si Ahmed Ahmed, 17 November 1922; letter Dubief to Si Ahmed Ahmed, 25 November 1922.
[46] FR ANOM Tiaret, "Circulaire. Prophylaxie de la Variole. Vacciations et Revaccinations obligatoires en ~~1921~~/1922," strikethrough in original.
[47] "Congrès des auxiliaires médicaux du 8 avril 1928," *Attakaddoum*, 101 (5 May 1928), 3.
[48] Louis Parrot, *Kitāb fī ḥafẓ al-ṣiḥḥa li-ʿāmma muslimī shamāl ifriqiyya* (Paris: Imprimerie nationale, 1922), 62.
[49] Lucien Raynaud, "La variole en Algérie," *BSA*, 337 (15 December 1925), 248-251.
[50] *Ibid*, quotation on 251.
[51] FR ANOM ALG AINTE I/9, letter Brégeat to préfet d'Oran, 20 June 1927.
[52] Brégeat, "Nécessité d'une équipe mobile pour lutte contre le typhus et la variole," 142.
[53] "Le Service central de l'hygiène publique et de la médecine preventive en Algérie (suite et fin)," *BSA*, 390 (May 1930), 156-176, reference on 158.
[54] On the origins of the *infirmière visiteuse coloniale*, see Claire Fredj, "Encadrer la naissance dans l'Algérie coloniale. Personnels de santé et assistance à la mère et à l'enfant 'indigènes' (XIXe-début du XXe siècle)," *Annales de démographie historique* 122.2 (2012), 169–203.
[55] ANA GGA DSP 223.
[56] ANA TDS 0438, letter Idir Zarouri to Dr Bendjelloul, Herbillon, 6 August 1927; letter Dr Bendjelloul to Sub Prefect Bône, s/c Mayor of Herbillon, 10 August 1927.
[57] ANA GGA DSP 079, "Voeux des auxiliaires médicaux," and letter Saïd ben Ahmed Dehnoun to Coutaud, 9 December 1932; ANA DZ/AN/17E/1727, Dehnoun, "Rapport moral, assemblée générale du 3 mars 1935, Amicale des Adjoints techniques indigènes de la Santé publique; ANA DZ/AN/17E/2031, "Commission de l'Assistance médicale indigène et de la Médecine de colonisation," séance du 10 Avril 1933.

[58] The quoted term is Amokrane Ould Amer's. See Julien Fromage, "Le docteur Bendjelloul et la Fédération des élus musulmans," in *Histoire de l'Algérie à la période coloniale*, 398-401.
[59] ANA DZ/AN/17E/1094, letter Amokrane Ould Amer to Lasnet, 24 August 1932.
[60] *Ibid*.
[61] *Ibid.*
[62] I have not made a systematic study of personnel files for IVC. Two dossiers dogged with scandal are ANA GGA DSP 029 Aucher, and FR ANOM 91303/127 de Santo. Further instances are discussed by Charlotte Ann Legg, "Imagining *Le peuple nouveau*: medicine and the press in French Algeria" (PhD Dissertation, New York University, 2013), 234-51; and Claire Fredj, "L'administration française et les soins aux 'indigènes': la mise en place de la 'triade médicale' dans l'Algérie des années 1920," in Elboudrari Hassan et Norman Daniel, *Les savoirs de l'administration. Histoire et société au Maghreb du XVIe au XXe siècle* (Casablanca, Fondation du roi Abul Aziz, 2015), 119-136.
[63] One possible source from which Sahraoui gained this information was Parrot, *Kitāb al-ṣiḥḥa*, passages of which were reproduced verbatim in *Attakaddoum (Le Progrès)*, 1 and 15 April 1924.
[64] Cf. the argument in Claire Fredj, "L'administration française et les soins aux 'indigènes,'" 119-136.
[65] ANA CK 78, letter Adjouati, Président de l'Association Amicale des Auxiliaires Médicaux de l'Algérie to Governor-General, 28 September 1927.
[66] *Ibid*.
[67] FR ANOM Tiaret, "Itinéraire des tournées de vaccination et revaccination 1927."
[68] *Ibid*.
[69] Archives régionales de Constantine, Constantine, Algeria (henceforth ARC), Archives communales 631,"Vaccinations. Etat des sommes dues à Monsieur Rahal Abbas. Adjoint technique de la santé Publique à El-Milia pour vaccinations & revaccinations operées pendant le mois d'Octobre 1936."
[70] FR ANOM AINTE/I9, letter Administrator to Médecin chef de l'hôpital auxiliaire Aïn Temouchent, 1 April 1940.
[71] ANA TDS 0438, "Feuille signaletique," Idir ben Tahar Zarouri, 1926.
[72] ARC Archives communales 631, "Sieur Benlabiod Abdelkader, Vaccinateur. Rapport général sur les opérations de vaccination effectuées […] pendant l'année 1936 (Automne)."
[73] The term is elaborated by Anke te Heesen, in "The Notebook: A Paper-Technology," in Bruno Latour and P. Weibel (eds.) *Making Things Public. Atmospheres of Democracy* (Cambridge, MA: MIT Press, 2005), 582-589.
[74] FR ANOM AINTE I/9, draft letter, Adjoint Principal Aïn-Temouchent to Adjoint technique de la Santé publique, 20 October 1939.
[75] FR ANOM AINTE I/9, letter Mirante to Administrator Aïn-Temouchent, 2 January 1939.
[76] Kamel Kateb and Djilali Sari dispute that state registration was comprehensive even in the 1950s, despite administrative attempts before the First World War and

throughout the interwar period to regularize the procedure. See Kateb, *Européens, "indigènes" et juifs en Algérie,* 21-5 and Djilali Sari, "La Transition de Santé en Algérie," *Proceedings of International Union for the Scientific Study of Population conference, Marrakech, Morocco, 27 September-2 October 2009*, 1-14, reference on 2, consulted on 29 February 2016 at http://iussp2009.princeton.edu/papers/90045.

[77] The full title for this form was *"Rapport general sur les operations de vaccination effectées en execution de l'arrêté préfectoral du 31 décembre 19__, pendant l'année 19__"*. Reports dating from the 1930s use pre-printed stationary forms from the 1920s, which leads me to assume a start date in the 1920s.

[78] ARC, Archives communales 631.

[79] *Ibid*.

[80] *Ibid.*

[81] For an explicit reference to this directive, see FR ANOM AINTE I/9, letter Youcef Aissaoui to Administrator Aïn Temouchent, 14 October 1940; letter Adjoint Principal to Prefect of Oran, "Vaccinations et revaccinations. Mémoires des sommes dues à M. Aissaoui Adjoint technique," 15 October 1940. See also *Délégations financières algériennes. Session Ordinaire de Mai-Juin 1936. Nº 4. Délégation indigène (Section Arabe et Kabyle)* (Algiers: Imprimerie Solal, 1936), ch. 11, 155-156.

[82] FR ANOM 93108/121. Letter Administrateur des Services Civils to Médecin de Santé, Sédrata, "Vaccinations antivarioliques," 23 May 1950.

[83] Service des archives de la Wilaya d'Alger, Algiers, Algeria (henceforth SAWA) 3V61. Procès-verbal, Etienne Goutaudier, chef de brigade de Rabelais, 24 November 1923

[84] Jeanne and André Brochier, *Livre d'or de l'Algérie: dictionnaire des personnalités passes et contemporaines* (Algiers: Baconnier frères, 1937), 16.

[85] *L'Echo d'Alger*, 25 March, 9.

[86] ARC, Archives communales 631, "M. Amrane Mohand vaccinateur. Liste nominative des sujets vaccinés et revaccinés," 15 January 1937.

[87] *L'Echo d'Alger*, 29 March 1936.

[88] *Ibid.*, 28 June 1939.

[89] *Ibid.,* 29 March 1936.

[90] "Circulaire du Gouverneur général aux Préfets au sujet des attributions des *Auxiliaires médicaux* indigènes (no. 1826)", *Le Bulletin sanitaire de l'Algérie*, 417 (August 1932), 228-230, quotation on 229.

[91] SAWA 3V61. Letter Belkacem Hili to administrator, Ténès, 7 November 1923; procès-verbal, Etienne Goutaudier, chef de brigade de Rabelais, 24 November 1923

[92] SAWA 3V61, letter Hili to Prefect of Algiers, 5 November 1923; letter Hili to Dr Lamarque, médecin de colonisation, Rabelais, 22 November 1923.

[93] SAWA 3V61, letters Sub-Prefect Orléansville/Chlef to Prefect of Algiers, 13 December 1923 and 20 December 1923.

[94] See David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley, CA: University of California Press, 1993); Sanjoy Bhattachary, Mark Harrison, and Michael Worboys, *Fractured States: Smallpox, Public*

Health and Vaccination Policy in British India, 1800-1947 (Hyderabad: Orient Longman, 2005).
[95] Clark, "Doctoring the *Bled*," ch. 5.
[96] FR ANOM 1K 504, "A l'Immortalité"
[97] Personal communications with Louisa Adjouati, see also Patrice Clarac, *Henri Choussat... itinéraire d'un médecin humaniste au XXème siècle : propos et documents* (Talence: OAREIL, 1996).