From Disease to Development: The case of Israel

Omri Tubi, Northwestern University

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Abstract:	Scholars compare Israel with settler colonies such as the United States, Canada, Australia, and New Zealand. In all these cases, European settlers were able to form a highly developed overseas polity at the expense of local populations. But unlike the cases it is compared with, pre-Israel Palestine was rife with malaria which threatened the political-economic viability of settlements and the lives of settlers. That Zionists turned disease to settlement and development makes this case puzzling, especially since prominent social science theories hypothesize that in settlement will fail in malarious territories. Empirically, I demonstrate the significance of an antimalarial campaign for Zionist colonization and state-formation. Theoretically, I suggest that relations and ties between the colonial rulers, the settlers and their diasporic community explain how settlement and development were possible despite disease. I contend that these relations are significant because they determine the flow of funds and scientific knowledge and expertise into the colony, shaping its prospects for political, social, and economic development.

Israel is frequently compared with other settler colonies such as the United States, Canada, Australia, and New Zealand.[1] In all those cases, a European immigrant population colonized a land at the expense of the local population and formed its own polity.

Out of the dynamics of colonization Israel emerged as what social scientists call a 'developmental state,' namely, a state that intervenes in the economy and social life more generally to pursue political-economic development.[2] This process was spearheaded by the Zionist Labor Movement and its dominant party Mapai.[3] Labor, Israel's foremost state-building elite, consolidated its power in pre-Israel Palestine from the early 20th century, under Ottoman and British colonial rule. Labor leadership was Eastern European in origin and adhered to collectivist-statist ideas common in Russia at the time. Therefore, alongside a firm commitment to colonization and immigration, Labor sought to control numerous aspects of social life.[4] Labor formed various organizations that provided its members with social services and protections from the exigencies of settlement, helping to advance the national project.[5] After 1948 when Israel attained sovereignty and into the 1970s, Mapai-led developmentalism was perhaps most pronounce, building on pre-state institutions and capacities.[6] Under Mapai leadership, the state absorbed large numbers of immigrants, allocated resources to meet security needs, controlled and invested in various infrastructures (e.g., transportation), and promoted agriculture, industry, and foreign investments.[7]

But how were Zionists able to colonize Palestine and build their developmental state? Since colonization began around 1880 and into the 20th century, malaria ravaged Zionist settlement. Settlers died or were too sick to work which threatened the economic viability of the settlements and the national project more generally.[8]

That Zionists turned disease to settlement and development helps refine a theory of colonization, disease, and development that originated in the work of economists Daron Acemoglu, James Robinson and Simon Johnson.[9] It became "arguably the most influential" theory in the study of colonial and settler-colonial development[10] and found purchase in sociology, political science, and policy circles.[11] According to Acemoglu et al, European settlement was impossible in areas with high prevalence of malaria and yellow fever because those diseases caused high settler mortality. The prospects of European settlement, determined by disease, had important institutional and developmental consequences. High-mortality disease environments led Europeans to form extractive institutions, transferring resources from the colonized to the colonizer. Alternatively, where disease environments were favorable to Europeans and malaria and yellow fever were not a significant health problem, there was mass European settlement and the development of representative institutions that replicate the institutions of settlers' home countries. Consequentially, these settler colonies saw significant social, political, and economic development. Acemoglu et al argue that mild disease environments characterized the cases Israel is compared with: Australia, the US, Canada, and New Zealand, which explains how Europeans were able to colonize them and turn them into highly developed nations.[12]

But Palestine's health conditions were very different, which makes Zionists' colonization and their creation of a developmental state puzzling. Empirically, I show that malaria was indeed a grave threat to Zionist settlement and demonstrate the importance of malaria control for colonization, state-formation, and development. Theoretically, I argue that the ties and relations connecting settlers, their diasporic community, and the British administration in Palestine made Zionist settlement and development possible even in face of disease. These relations are

significant because they facilitate the flow of critical resources into the colony, such as funds and scientific knowledge and expertise, which shaped the colony's political, social, and economic development. When resources flow into the colony they have a lasting effect, even after the relations that facilitated their flow break down.

To demonstrate this argument, I examine the work of a Zionist Malaria Research Unit (MRU) that operated in Palestine between 1922-1931 and the work of ex-MRU malariologists following the unit's disbandment. The MRU was the most important Zionist antimalaria agency.[13] It saved early Zionist settlements from demise and laid the foundations for malaria control in the country.[14]

In what follows, I situate my argument within the scholarship on Israel/Palestine and discuss my theoretical contributions. Then, I discuss my data and methods. The empirical sections begin with a demonstration of the obstacles malaria posed to Zionist colonization and discuss the shift from Ottoman to British rule. I focus on the work of the MRU, the consequences of its disbandment and the impact of the Arab Revolt on Zionist antimalaria. I also examine antimalarial operations during World War II into statehood.

Studies of Zionist Colonization

This article builds on three existing veins of research on mandate Palestine and Israel: settler colonial scholarship, represented in the works of Gershon Shafir, Baruch Kimmerling and others; studies of capitalist economic development; and studies of Zionist health enterprises. In this section, I situate my argument in relation to each of these branches of research.

The first branch of research I build on, settler colonial scholarship, developed since the 1980s when an increasing number of scholars came to view Zionism as a settler colonial

movement, comparable to other cases of overseas European colonization.[15] These studies demonstrate how Zionist settlement and state-formation methods developed from the late 19th century until World War I.[16] Following the war, Zionists enjoyed the supportive umbrella of British rule that allowed them to immigrate to Palestine, purchase land and develop various social, cultural, and political institutions that served as a nucleus for a future Jewish state.[17]

Scholars such as Shafir and Kimmerling focused on colonization, political and economic development, and on Labor's rise to power.[18] As socialist Zionists immigrated to Palestine during the early 20th century, they tried to find work in agriculture in existing Jewish colonies formed since the 1880s by earlier Zionist immigrants. These socialist immigrants saw themselves as workers and began to organize politically, laying the foundations to what became the Labor Movement. However, workers struggled to survive economically in Palestine. They could not compete in the labor market with the local Palestinians who were cheaper and better workers accustomed to agricultural labor and therefore preferred by existing Jewish colonies.[19] To survive, workers allied with the World Zionist Organization (WZO) which purchased land for exclusivist Jewish colonization and provided them with protections from the exigencies of settlement. These developments shaped the fundamental practices of Israeli nationalism, and its separatist inclination towards the Palestinians.[20] Out of the hardships of settlement, Labor also developed organizations of social provision that catered to the needs of their members, offering them "strategies of survival" in their new country.[21] These organizations were embodied in a quasi-statist labor union and acted as important political mobilization tools.[22] These foundations allowed the Zionist Labor, and more specifically Mapai, to accumulate power and dominate Jewish-Zionist politics. These were also the foundations used to construct the Israeli developmental state.[23]

I complement settler colonial studies in two ways: One the one hand, while I share these studies' attention to political and economic development and to the dynamics of colonization, I also extend them by showing that public health was critical for the processes they focus on. The political-economic survival of many Zionist settlements depended on malaria control because of the disease's effects on Jewish labor and because of the medical expenses it caused. On the other hand, studies such as Shafir's and Kimmerling's were criticized for overemphasizing the organizational power of Labor to the exclusion of other actors who contributed to state-formation. This tendency also led to implicit anachronism, projecting Labor's state-era hegemony backwards, into the pre-state period.[24] I suggest these critiques have merit. I show that Labor's settlements and its accumulation of power would have faced serious obstacles without the work of the MRU and the ties and relations between non-Labor actors. Indeed, Labor benefited from those relations, but it did not play a significant role in facilitating them or in the importation of resources.

The second branch of research I build on is studies of capitalist economic development. Studies in this vein examined the role played by the private sector and private capital in Palestine's economy and in Zionist politics.[25] This scholarship shows that British-Zionist relations, development schemes, and the flow of resources into the country were informed by ideas about Palestine's integration to the global economy, consumption, production and a shared vision regarding the country's development.[26] Indeed, the British viewed Zionists as useful development agents whose capital and initiatives would enable Britain to make the best of Palestine, extract its resources, and boost the imperial economy.[27] Such schemes and relations imported to Palestine not only capital, but science, knowledge, and technology, used to support Zionist goals in the country, create and define the Jewish national home, and demarcate Palestine

as a distinct geographical entity. At times, public health activities, including malaria control, supported such development schemes.[28]

I am sympathetic to the capitalist development vein. In malaria control as in capitalist development, the British were fond of Jewish initiative and capital. Together with Zionists, they recognized the economic value of malaria control and land reclamation, which led to the creation of the MRU. There is also no doubt that the MRU's work helped create a geographical nucleus for the future Jewish state, and that it supported the political-economic survival of Jewish settlement. As funds flowed transnationally amid British-Zionist cooperation, antimalarial operations supported Palestine's development with important political consequences.

However, unlike studies of capitalist development, my focus is not the private sector or imperial economies. My use of the concepts "development" and "developmental" follows social science scholarship[29] and relates to the settlers' nation-state. I show that antimalarial schemes helped Labor build its power and realize its ideological commitment to state intervention in the economy and in other areas of social life. True, antimalaria supported Jewish labor and therefore supported production. But it also helped materialize a distinct political agenda and set the Jewish community and later Israel on course towards *state-led* developmentalism.

Lastly, the third branch of research I build on is studies of Zionist health enterprises. Scholars working in this vein have long demonstrated the significance of public health for colonization and the national project more generally. This scholarship also examined the relations between Zionists in Palestine and their diasporic, American Jewish community, highlighting public health activities in Palestine by US-based organizations.[30] More specifically, histories of malaria in Palestine showed the relationship between disease, colonization, and

development.[31] These studies shed light on how malaria control contributed to settlement, the significance and the American roots of the MRU, and the units' relations with the British.

I add to this branch of research empirically by illuminating critical additional components of the history of Zionist health enterprises. For example, as part of examining the flow of resources into the colony, I show that the MRU was essentially a Zionist version of the operations of the American Rockefeller Foundation. I also examine the impact of the Arab Revolt (1936-1939) on Zionist antimalaria – an impact that received only scant attention thus far – and show that Palestinian resistance had a substantial, lingering effect on Zionist malaria control. Lastly, I examine antimalarial operations during and after the transition to statehood and discuss how they supported the main tasks of the period: immigration absorption, colonization and economic development.

Building on these three lines of research and on Acemoglu et al's work, I agree with the claim that malaria can pose a significant threat to colonization and development. However, settler colonialism is never affected by domestic conditions alone.[32] It is shaped by a relationship between groups and actors that are both internal and external to the colony: the settlers, the metropole, the colonial administration, the local population and, in the Zionist case, diasporic communities.[33]

I show that the relations and ties between the settlers, their diasporic community, and the British explain how Zionists were able to colonize Palestine and pursue its development despite high malaria prevalence. I contend that these relations and ties are important because they determine the flow of resources into the target territory, with the potential of shaping the colony's political, social, and economic development. The most important resources for Zionists

were capital and scientific knowledge and expertise. They were especially critical for fighting malaria, solving the political-economic problems it caused, advancing colonization, and for the eventual creation of the state.

I also show that once resources flow into the colony they have a lasting effect, even if the institutions and relations that facilitated their flow had been altered or collapsed. The scientific knowledge the MRU imported to Palestine was highly important, even after the MRU ceased to exist. Then, former MRU staff applied the unit's knowledge and methods to keep fighting malaria, support existing settlements and advance colonization of new territories. It also enabled development schemes and immigration absorption.

The Israeli case also shows the importance of the agency and resistance of local populations for the relationship between disease, colonization, and development. I show that Palestinians' resistance to colonization had important effects on disease environments and on settlers' ability to fight disease. Concretely, I show that the Arab Revolt of 1936-1939 – a Palestinian uprising against the British and Zionists – complicated malaria control in newly formed Jewish settlements and necessitated Zionists to find solutions so they could continue pursue colonization. These solutions kept informing Zionist antimalaria even after the revolt ended, demonstrating the impact of Palestinian agency.

Data and Analysis

Data for this article consists of archival documents, books by key actors, memoirs, newspaper articles, and scientific publications. Much of the data comes from the Central Zionist Archives (CZA) in Jerusalem and the archives of the American Jewish Joint Distribution Committee (JDC). In the latter, I use documents from the JDC's New York Office from the years 1921-

1932. I collected other documents and materials at the Center for Jewish History (CJH), the Israel National Library, Israel State Archives (ISA), online libraries such as Internet Archive. Some of the books I use as primary sources were purchased on the market.[34]

Parts of my analysis stress the exigencies of settlement and the sacrifices of settlers, perhaps echoing some sentiments of mainstream Zionist accounts/narrative. However, critical analyses of Zionist colonization, such as Shafir's, not only recognized but to a large extent *revolve around* the exigencies of settlement and the struggles of settlers. Where critical analyses depart from ethos is in how they explain settlers' ability to overcome obstacles: Zionist ethos stresses settlers' sacrifice, bravery, and ideology.[35] Critical analyses emphasize the active political-institutional support and social protections settlers received. This article belongs to the latter group.

Malaria and Colonization

Malaria in Palestine was transmitted by anopheles mosquitos that bred in cisterns, swamps, streams, and other sources of water throughout the country. A bite from a female anopheles mosquito injects the malaria-causing plasmodium parasite into a person's blood stream, causing symptoms like fever and chills.

Due to security issues, taxes, and malaria itself, Palestine's Arabs concentrated mostly in some cities and on the eastern hills while the coastal plain and northern valleys remained sparsely populated. The hills offered some relief from malaria, given their distance from large bodies of water such as the coastal swamps.[36]

Alternatively, Zionists, coming from Europe and being ignorant about malaria, purchased lands in the swampy, highly malarious plains and valleys, believing excess water was an

advantage and because these lands were readily bought.[37] In some cases, settlers refused to heed doctors' advice and settled despite warnings the locale will prove malarious.[38]

The disease threatened colonization from its inception as it almost wiped out the first Jewish colonies. For example, Moshe Smilansky of the colony Hadera wrote that during one malaria epidemic, all the settlers fell ill and were forced to leave and wait until health conditions improve.[39] After their return, the disease kept battering the colony. The first Jewish colony in Palestine, Petach Tikva, faced a similar fate. Its settlers were forced to leave for two years because of malaria,[40] returning only to continue suffering from the disease.[41]

Malaria had adverse effects on many of the settlements established as part of the Labor-WZO alliance. While Shafir called this alliance as "the bedrock of Israeli state-formation,"[42] malaria made these foundations shaky. Zionist official Artur Ruppin hailed settlements such as Kinneret, Hulda, and Degania as the future of the national movement, writing they "will forever occupy a place of honour in the history of Jewish colonisation."[43] Yet these settlements suffered immensely from malaria and from blackwater fever – a dangerous complication of malaria.[44] Other settlements on national land were also in terrible condition. Zionist activist Shmuel Dayan of Nahalal referred to the fight against malaria as "the solution to our existence," without which settlers feared they would die without even settling.[45]

Many Labor members who became Israeli leaders suffered from malaria after arriving at Palestine. Notable examples are David Ben Gurion, the Labor's formidable leader and Israel's first Prime Minister as well as Yizhak Ben Zvi, Israel's second president.[46] Above-mentioned Dayan who became a member of the Israeli parliament also had malaria as well as Labor ideologues Berl Katznelson and A.D. Gordon.[47] Malaria was so rife, Zionists considered a

malaria bout as a "certificate of citizenship" that signaled belonging to the land.[48] Those who did not have it were "almost ashamed," as Ben Zvi's wife Rachel wrote.[49]

More than just a health problem, malaria was a political-economic problem because of its effects on labor, immigration, and importation of private capital. The disease threatened colonization because it caused severe economic losses in lost workdays and medical aid, as happened in Merchavia, another settlement formed on national land,[50] as well as in Hulda.[51] Ruppin wrote malaria was "perhaps the most important problem" that long thwarted settlement because of the human and economic toll it took.[52] Another Zionist official, Avraham Granovsky, noted that malaria was "the worst foe for human well-being in Palestine"[53] and that it is a significant hindrance to settlements' productivity.[54]

For Ruppin, the prevalence of malaria in Palestine placed an additional financial burden on the WZO because it interfered with attracting private capital into the country. Malaria, Ruppin claimed, was one of the reasons that deterred wealthy European Jews that could invest their own funds in agricultural settlement from immigrating to Palestine. This necessitated the WZO to invest more national resources in settling poorer immigrants.[55]

Despite these conditions, Zionist colonizing institutions that purchased lands for national settlement such as the Jewish National Fund (JNF), did not take malaria seriously before the 1920s. Granovsky wrote that the JNF's early attempts to fight the disease "were not… very comprehensive at the time… not too much importance was attached to reclamation in those days by the Zionist Organization in general."[56]

The Mandate and the Flow of Resources: From Ottoman to British Rule

During World War I, the British empire conquered Palestine, ending some 400 years of Ottoman rule. Then, the British ruled the country for 30 years in which Palestine was part of the League of Nations' Mandate System. Until the eve of the War, the Zionist movement lacked any real achievements.[57] One reason for pre-war weakness was the hostility of the Ottomans towards Zionism.[58] From the beginning of settlement, the Ottomans opposed and tried to thwart Zionists by restricting Jewish immigration and land purchases. Additionally, Palestine's Arabs' opposed Zionism. Therefore, the Ottomans saw Zionists as unwanted European intruders. Zionists made limited headways in Palestine only by exploiting legal loopholes and because of pressures by European countries of which settlers were citizens.[59]

Unlike the Ottomans, British rule followed the 1917 British Balfour Declaration which recognized the Jewish right for a "national home" in Palestine. It also promised that the British would create the conditions for facilitating the national home, that they would aid Jewish settlement and that a "Jewish Agency" would be established to help administer the country together with the British. Palestine's Arabs were not mentioned by name, and the declaration only referred to the protection of "non-Jews" in Palestine. Arab opposition was insignificant in British eyes.[60] The declaration was the first significant Zionist achievement and the first major threat to Palestine's Arabs since Jewish settlement began.[61]

Aside from an officially favorable attitude towards Jewish colonization and political development, British economic policies determined the scope of service provision in Palestine. In turn, the extent of service provision created opportunities as well as challenges for Zionists, which facilitated the flow of critical resources such as funds and scientific knowledge and expertise into the colony.

Traditionally, the British aspired to minimize metropole expenses on the colonies. That Palestine was a future Jewish national home only strengthened this tendency.[62] As in other colonies, expenditure on health and education in Palestine made up only 12 percent of the British administration's budget.[63] Allocations for health services took 6.2-9.6 percent of the budget between 1920-1923, before dropping to 3-4 percent in later years.[64] Alternatively, administrative and security expenses totaled about 50 percent.[65] As in other colonies,[66] British health initiatives were limited, insufficient and prioritized protecting British soldiers and officials. The local population enjoyed British health activities only to the extent that it served the economic development of the country and the protection of British personnel.[67] Therefore, British policies brought Zionists to develop their own medical services. Viewing Zionists as useful developers, the British promoted Zionist goals to cut on their own expenses.[68] This explains why the British welcomed the formation of the MRU as it was paid for by Jewish bodies.

The MRU

The MRU was formed in September 1922 as part of the British administration's department of health.[69] With the unit, Zionist leaders sought to import to Palestine the most advanced scientific knowledge and expertise available to rid the country of malaria and facilitate colonization. Previous studies[70] missed a key fact about the unit and about the transfer of scientific knowledge and expertise into Palestine: the MRU was essentially a Zionist version of Rockefeller Foundation (RF) activities, utilizing American colonial science.

The MRU formed after American Supreme Court justice and Zionist leader Louis Brandeis visited Palestine in 1919 and saw malaria's devastating effects. Therefore, he wanted to eliminate the disease in Palestine like American colonel William Gorgas did in the Panama

Canal.[71] Other American Zionists also invoked US experience in Panama.[72] To Brandeis, eradicating malaria was an urgent task that was to give settlers the ability work.[73]

Brandeis donated funds to begin malaria control experiments in Palestine, headed by Prof. Israel Kligler of the RF. After the experiments' encouraging results, the MRU was established.[74] Though organizationally a part of the British administration, the unit was funded by the American Jewish Joint Distribution Committee (JDC). At its height, unit staff numbered about 20 people, including a controller (Kligler), bacteriologist, sanitary and engineering inspectors, and field inspectors.[75]

While the British treated urban malaria, the MRU focused on *Jewish* rural settlements. It extended activities to Arab villages only if "means permitted," and when it was deemed important for Jewish health.[76] In general, malariologists' view of Arabs was negative. Kligler claimed that Arab peasants have a low intellectual level and that given morbidity rates among them, Arabs might infect Jews with malaria.[77] The rationale was that if a mosquito bites a sick Arab and then a healthy Jew, malaria parasites can be transmitted from the former to the latter. However, malariologists knew that mosquitos do not obey artificial boundaries. Hence, control operations must include a large enough area around Jewish settlements to secure their health, including Arab villages if necessary.[78]

Demonstrating the transfer of resources such as scientific knowledge and expertise, the MRU followed RF footsteps. The MRU's scientific method, practices, and organization mimicked RF's International Health Board's (IHB) work in the US and the colonial world. Kligler did not just work at Rockefeller, he studied yellow fever in Panama with Hideyo Noguchi, a leading RF scientist.[79] The person who suggested Kligler to undertake malaria control in Palestine was Simon Flexner, head of the Rockefeller Institute and brother of JDC's

Bernard Flexner.[80] Besides S. Flexner, prominent RF figures like Wickliffe Rose, Victor Heiser and J. A. Ferrell were familiar with antimalaria and medical work in Palestine.[81] Scientifically, Kligler wrote that "the criterion for success in the building of the Panama Canal was the eradication of the mosquito; the same criterion conditions the success of rebuilding our home in Palestine."[82] The emphasis on mosquito eradication characterized RF malariologists.[83] Kligler's initial experiments copied and sought to generalize the IHB's work in the southern US states to Palestine.[84] There was also a plan to send some MRU personnel to the southern states to experience malaria control there, courtesy of the IHB.[85] As one of the pioneers of Zionist health work in Palestine wrote about the antimalaria campaign: "the whole paraphernalia developed in Panama and Arkansas, etc. have been applied."[86]

The RF background of the unit is important for its relationship with the British. The MRU's status as its own unit within the administration's department of health was not "unique" as previous studies argued.[87] It reflected a practice the RF called "team-play in malaria control."[88] Essentially, the RF worked with and as part of the existing authorities in the US southern states, while maintaining RF staff distinct from that of the state.[89]

Establishing the links and ties between the British, the settlers, and their diasporic community as well as the scientific prowess of the MRU demonstrates the imbalance between Zionists and Palestinians in the field. Palestinians had their own malaria-fighters, such as Dr. Tawfiq Cana'an and some antimalarial inspectors working for the British. But Arab doctors were not trained malariologists.[90] Palestinians had no MRU-equivalent and they remained dependent on inadequate British services.[91]

Advancing Colonization Under British Rule

The MRU's scientific methods complemented Zionist territorial politics. Kligler saw public health as key to state power[92] and together with other MRU malariologists, he argued against the prevalent use of quinine prophylaxis to combat malaria,[93] claiming it only masks latent infection that later causes relapses.[94] Instead, the MRU preferred controlling and regulating streams, swamps, standing water and irrigation.[95] This focus complemented colonization by focusing on making the territory habitable, rather than the individual body healthier.[96]

In line with RF operations,[97] the MRU undertook both scientific and educational activities. The unit produced knowledge that oriented antimalarial operations. Since there was no comprehensive statistical data on malaria, the MRU and the British had to create one.[98] The unit studied and classified mosquito breeding places; the types and prevalence of the different malaria-causing plasmodium parasites; mosquitos' habits; the etiology of malaria and so on.[99] Unit malariologists considered the education of the population a key component of antimalarial operations and sought to establish direct contact with settlers.[100] Indeed, the MRU mobilized the entire Jewish population to fight the disease by teaching settlers about malaria's causes, prevalence, and prevention. Children had lectures about malaria, followed by a tour of the colony with explanations by an antimalarial inspector that pointed at potential mosquito breeding places and demonstrated how to control them. Doctors spoke to each person and explained the importance of the work. There was continuous surveillance and attempts to "keep the issue alive."[101] Throughout the year, an antimalarial inspector made sure all inhabitants do their part, energizing the negligent if necessary.[102] These efforts proved successful.[103]

The MRU and the Jezreel Valley Settlement Scheme

The MRU made valuable contributions to the central settlement project of the 1920s: the colonization of Jezreel Valley,[104] that came to be known among Zionists as "the Emek" (meaning, "the Valley").

The colonization of Jezreel Valley was supremely important for the national project. Historian Anita Shapira wrote that it was this settlement project that fortified the WZO-Labor relationship,[105] cementing the synthesis that was the backbone of Zionist state-formation.[106] All the settlements in the Valley were agricultural-collectivist. They embodied the lessons learned from earlier colonization attempts and were designed to secure exclusive Jewish labor on Jewish-owned land, safeguarding "the Jewish character of settlement."[107]

The colonization of Jezreel Valley strengthened Labor's power and its capacities for mobilizing its own members,[108] creating an important steppingstone for future Israeli developmentalism. Settlement in the Valley was a prime example for the infusion of colonization with Labor-imported Eastern European collectivist-statist ideas. It was there that Labor's ability to control numerous aspects of its members' life[109] developed: collectivist settlement included the imposition of internal discipline, and the members of these settlements willingly harnessed themselves to fulfil national tasks, standing at the forefront of the Zionist project.[110] The valley's colonization also created powerful collective symbols such as the soil-tilling pioneer who sacrifices for and is always at the disposal of the national project. These symbols would prove immensely effective not just during the pre-state period but would become an inseparable part of Israeli mythology.[111] Settling "the Emek" was a defining moment in the history of Israeli state-formation.

How is the MRU related to all of this? Jezreel Valley was not just a site for experimentation with new social and colonization designs,[112] it was also full of swamps and

highly malarious, a fact that threatened settlers' lives and colonization efforts.[113] JNF official Yosef Weitz noted that Zionists faced a problem: they understood that for settlement to proceed, malaria must be treated but they lacked the technical knowledge on the matter[114] – perhaps because the settlement project began before the MRU was officially created. Zionists brought engineers who tried to control malaria with drainage, but their work only increased morbidity and hurt those employed in drainage.[115] Thus, Kligler reported in 1923 that Jezreel Valley suffers from the highest malaria incidence of all the areas under MRU control and that "epidemics broke out in almost all the places [in the valley] and most of them were directly due to the drainage operations which were carried out there."[116]

Only with MRU intervention swamps were successfully drained, and colonization could proceed. Both Weitz and Joseph Breuer, one of the engineers that worked for the JNF in the Valley, acknowledged that this success was due to the MRU's guidance of engineers' work and its ability to reduce morbidity.[117] Kligler made similar claims and reported that the MRU was able to compel the engineers working in the Valley to collaborate with it and consider antimalarial needs in their work.[118]

If Israeli developmentalism was closely tied to the creation of a viable political economy and to Labor's accumulation of power, colonization in "the Emek" was key to developing this power, demonstrating how Labor ideals can be implemented and developing symbols that would come to define Zionist collectivity. But all this was possible only with the help of the MRU.

The Outcomes of the MRU's Work

The significance of the MRU's work to Zionist colonization cannot be exaggerated. First, data suggests the initial work of the unit was what inspired large scale Zionist antimalaria operations.

The MRU was not the only agency undertaking antimalaria work. The JNF, as I mentioned, tried to control malaria even before World War I but did not consider these efforts important and they were accordingly insufficient.[119] Alternatively, Kligler wrote: "coincident with the organized antimalaria campaign and largely as a result of it, various colonizing agencies have undertaken reclamation and antimalaria drainage." [120] A 1936 report established a similar time sequence. The report mentions that Jews "attacked [malaria] in a planned and systematic manner. In the first place," the MRU was formed, while "in the second place" the "Jewish colonizing agencies – the Jewish National Fund, the PICA and others, adopted a policy of drainage reclamation."[121]

Second, the MRU helped open vast territories to large-scale colonization. Between 1922-1932 Zionists purchased some 212,000 acres of land which tripled Jewish landownership in Palestine. Many of these areas were malarious and necessitated drainage.[122] The unit conducted some work on its own, but also collaborated and supervised the antimalaria work of the JNF and other colonizing agencies.[123] Most of the MRU's collaborative efforts with the colonizing agencies were "carried out along standard lines"[124] – which implies MRU methods were generally accepted – and yielded good results. By 1925, highly malarious areas around Petach Tikva, Ekron, Rishon LeTzion and Hulda as well as places on national land in Jezreel Valley and the Lower Galilee became malaria-free.[125]

Third, Kligler tried to shape colonization policy and, in theory at least, was successful. His efforts sought to place antimalaria at the heart of Zionist colonization, arguing malaria control should precede settlement, and colonization agencies should not send settlers to colonize malarious lands.[126]

In 1925 Ruppin agreed to heed Kligler's advice to coordinate settlement efforts between the MRU and Zionist bodies.[127] By 1926, Granovsky, Ruppin, and other Zionists admitted "a

radical change" of policy: "the settlers were no longer dumped down on marsh lands. Throughgoing reclamation works were carried out in advance of actual settlement."[128] While there are ample examples of colonization taking place without considering health needs throughout the period of British rule and into statehood,[129] Kligler's message was received even if not always practiced.

Altered Relations and MRU Disbandment

The MRU began to change in 1926, when Kligler left to the head the department of hygiene at the Hebrew University. Antimalarial research was now undertaken by the Malaria Research Station in Rosh Pina, established in 1927 under the University and headed by ex-MRU malariologist Gideon Mer. The MRU also began to transfer its control districts to the British government until it finally disintegrated in 1931.[130]

The MRU's RF roots played a role in the disbandment. Following RF principles, the MRU and JDC expected the British to assume larger financial and administrative responsibility over control operations as antimalaria progressed.[131] Similarly, when the RF worked with local governments, it thought of itself as forming a *temporary* health organization.[132] Its purpose was to stimulate existing authorities and public interest in health activities, which would lead governments to increase their funding and develop permanent health services.[133] The JDC and MRU expected the British to do the same.

This was a grave miscalculation of British colonial economics. The British refused to invest large sums in antimalaria, arguing morbidity dropped to a manageable level. While the administration's department of health did take over the MRU's districts, it absorbed only a few of the unit's inspectors and made antimalaria just one of their many assignments.[134] Ex-MRU

malariologist Zvi Saliternik lamented decentralization, calling the period between 1931-1949 "a sorry state of orphans' work without a 'father.'"[135]

The decentralization of antimalaria caused severe problems for Zionists from 1928 onwards. Disease jeopardized settlement again and previous years' success began to unravel since malaria required constant supervision. Because the MRU began to disintegrate, "the malaria question received renewed acute form."[136] As the British administration's supervision loosened, so did settlers' care. Epidemics broke but the British refused to take responsibility while Zionists failed to form an MRU alternative.[137] Additionally, while the unit was part of the department of health it enjoyed its coercive powers, yet Zionist political and national institutions had no such powers[138] and could not compel settlers to adhere to antimalaria requirements. As the unit disbanded, "the means required for excellent work disappeared with it."[139]

Failing to re-centralize malaria control, the Zionist Health Council tried to find solutions to the malaria problem and decided to transfer responsibility for antimalaria to settlements' physicians. Those physicians worked for the Labor's Sick Funds and for Hadassah Medical Organization, both national bodies that constituted the mainstay of Zionist health infrastructure.[140] The Council itself provided some general supervision and encouraged settlers to take protective measures[141] while Zionist institutions pressured companies and local councils to hire ex-MRU inspectors. The JNF also hired inspectors.[142] Lastly, the Council tried to get the British to increase their supervision and the number of antimalarial inspectors in the Jewish sector. Until 1936 Zionist political institutions in Palestine tried to press the British on these issues, argued that disbanding the MRU was a "severe mistake"[143] and asked the British to form "a special [antimalaria] section" in the department of health.[144]

In short, with the alteration of relations between the British, the settlers, and the settlers' diasporic community, Zionist antimalaria suffered. However, while the cessation of flow of financial resources caused severe problems, the scientific knowledge and expertise inherited from the MRU proved invaluable for the continued fight against malaria and for further advancing colonization.

By 1936 a new threat loomed: growing Arab discontent with British colonialism and Zionist colonization escalated to violence in the Arab Revolt (1936-1939). The revolt had important repercussions for Zionist antimalaria activities. It complicated and shaped Zionist antimalaria in important ways that show the great impact of Palestinian agency.

It is important to note that Palestinian agency and resistance shaped Zionist antimalaria long before the revolt. Resistance took several forms such as protests, demonstrations or breaking pipes used for drainage.[145] Nahalal, for example, saw local disputes between settlers and villagers surrounding drainage that interfered with providing water for Arabs' herds.[146] The disputes brought the governors of Nazareth and Zionist land purchaser Yehoshua Hankin to weigh in, to no avail. Eventually, settlers and villagers succeeded in finding a solution that allowed for both drainage and herd-watering. However, I suggest that the revolt had a far more significant impact on antimalaria than these local disputes.

Resistance, Malaria: How the Arab Revolt Changed the Way Settlers Dressed and Smoked

The revolt consisted of economic measures such as boycotts and strikes as well as fighting by Arab groups. Its intensity varied. At times, Palestinian resistance caused the British to lose control over the country.[147] While the revolt was directed mostly at the British, Jews were also attacked – and retaliated. The British restored order and control only after using firm

measures.[148] In response to the violence, Zionists embarked on a large colonization campaign, breaking into new territories and erecting fast-built, fortified "stockade-and-watchtower" settlements.[149]

Examining the impact of the revolt on Zionist antimalaria is important both theoretically and empirically. Theoretically, it demonstrates the importance of resistance by the local population to our understanding of the relationship between disease, colonization, and development. Empirically, historians acknowledge that violent outbreaks such as the Revolt were "never fully understood in terms of their influence on everyday health conditions in Palestine."[150] Despite this assertion, they dedicate little room to consider the Revolt's impact on Zionist antimalaria and do so only very generally.[151] Thus, this section of the article fills important empirical and theoretical lacunas.

The revolt and the Jewish response created conditions for epidemic outbreaks, which threatened colonization once again.[152] There were numerous problems. The new watchtower-and-stockade settlements were built without regard to health conditions and were surrounded by swamps.[153] Saliternik wrote:

> We need propaganda [*hasbara*], propaganda, and propaganda not just for the people but also for the [Zionist] Settlement Department which is now repeating the mistakes we made 17-18 years ago. We must repeat the necessity to consult with the appropriate medical institutions before, during, the after settlement and making plans for the settlement.[154]

Another problem was revolt-related population movements. Arabs joined the fighting groups and hid in villages while Jewish guards regularly patrolled at night and immigrant Jewish youth joined the settlements. There was also British police and military presence. These

movements influenced morbidity. Some of the individuals arriving at Jewish settlements came from relatively malaria-free areas and did not know how to adequately protect themselves in more malarious locales.[155] Landowning Arab families left the country because of the security situation and the department of health could not instruct them to treat the swamps on their land. This, according to Saliternik, effected morbidity in nearby Jewish settlements.[156]

Cattle did not graze the vegetation in the swamps and riverbanks, which made their treatment with anti-mosquito chemicals harder.[157] "If the security situation does not change," Saliternik wrote, "we will reach a situation that in the streams and wadis that are… distant from Jewish settlements we will not be able to undertake proper antimalarial operations."[158]

Zionists had to find a way to effectively treat malaria even more urgently than before. They resorted to using the knowledge they acquired during the MRU's existence. Saliternik, who clearly adhered to MRU methods,[159] was appointed by Zionist institutions to oversee malaria control in the Jezreel valley, Jordan valley and the new stockade-and-watchtower settlements. He constituted himself into a one-man semi-formal antimalaria agency.[160] As one of the conditions to accepting this appointment, Saliternik argued the situation necessitates not an inspector that works under other institutions, but an autonomous antimalarial manager that solves problems on the spot, and that no institution or individual acts without his approval.[161] His function as a one-man agency is also evident in the volume of his correspondence, reaching over 500 letters a year,[162] and in the demands he made from settlements, Zionist institutions and so on. These demands included trying to impose lockdowns by prohibiting unauthorized trips and large gatherings in the settlements to "disconnect the routes of mass malaria spread in the country."[163] Saliternik also recruited members from settlements in his control areas and trained them in

antimalaria.[164] He tirelessly tried to train more people to assemble a group that will work under him.[165]

The revolt's impact on antimalaria made control efforts turn into the settlements themselves. Now, measures included spraying larvicides in rooms; personal use of mosquito repellents; fixing mosquito nets, doors, windows, pipes, and hydrants and so on. Control measures had to be adjusted to deal with Palestinian resistance, its implications for disease and its consequences for the prospects of colonization.

Revolt-related adjustments rejuvenated attempts to educate and instruct the population on malaria control and to make sure instructions were indeed followed. Saliternik frequently mentioned the settlers' negligence. In some cases, they made fun of instructions.[166] While education was always critical for malariologists, Saliternik now argued:

> In the education of the inhabitants – old and new – [we] must see the most important way of our action going forward. It is our duty to instill the rules of precautions in people's consciousness until they become a natural habit.[167]

To that end, Saliternik instructed his trainees to inspect and surveil their fellow settlers. The trainees made unannounced visits to people's rooms and interrupted their sleeping comrades so that the latter would fix their mosquito nets.[168]

As scholar Dafna Hirsch[169] have shown, some Zionist public health initiatives included the creation and inculcation of a "hygienic repertoire:" habits and behaviors that were supposed to increase cleanliness among the population and create healthy subjects for the national project.

In a similar manner, the revolt caused Saliternik and his colleagues to develop and inculcate an "antimalarial repertoire." This repertoire is evident in the detailed and meticulous instructions aimed at governing the minutiae of settlers' conduct. The settlers were not only told

to fix doors and windows or use mosquito nets, but how to hang the net, how it should be folded under their mattress, and what shape their mattress should be. They were advised to stay in their rooms an hour before sundown and after sunrise to prevent mosquito bites and not to exercise or wash in nearby streams in the evenings. Inhabitants were also instructed how to use larvicides correctly in their rooms (spray diagonally towards the ceiling, let the spray work for 10-15 minutes in a closed room, etc.) and how to turn a light on and off so mosquitos will not penetrate (turn it on only after the door is closed behind you, turn off before you open it). Night-watchers were to wear long pants tied to their legs, socks, and long-sleeved shirts, with the sleeves down and the collar up. They were advised to constantly move while outside,[170] and if they felt mosquitos at night and the security situation did not prevent it, "it is best to smoke because the smoke scares the mosquitos away."[171] Night-watchers also received a special mosquito repellent to be applied every three hours. Their use of the material was recorded to study its efficacy.[172]

Saliternik's efforts had tangible results. When members of one *kibbutz* stopped using mosquito nets, the local inspector placed a tube with anopheles in the communal dining room – and achieved the desired effect.[173] Members of Tel Amal also fulfilled the antimalarial instructions and stopped washing at night in the Asi stream.[174] They showed eagerness to use mosquito repellents, which became popular in other settlements too.[175]

The changes caused by Palestinian resistance made Saliternik articulate a new understanding of the relationship between malaria control and state-building. Due to the hostilities, Saliternik called for "personal public defense"[176] that saw the health of the individual body as the key to the health of the social-national body.[177] This idea began to appear during the late 1920s, as Zionists adjusted to the MRU's disbandment,[178] but Saliternik pushed it even further. In 1937, he wrote to some of the settlements under his control, alerting them to the

malaria threat. To Tel Amal he wrote, "as you know, there is no way of protecting you this year… besides by personal protection of every man for his own life."[179] In his letters to the settlements Saliternik acknowledged that maintaining his instructions, such as wearing long sleeves in the summer, might be hard but "this is the need of the hour and there is no other way."[180] He asked settlers to prove they can follow his instructions and maintain the highest level of culture and maturity. Settlers were to show that "you know by self-education… to watch from malaria, the fatal disease, the individual and the collective, that are so dear and needed to advancing the rejuvenation of the people and the country."[181]

Legacies of Revolt: Zionist Antimalaria in the 1940s

As the revolt ended in 1939 Palestinian society was devastated. Thousands died, and even more were detained, including many Palestinian leaders. The economic blow was hard and much of Palestinians' agricultural yield was ruined.[182] Jewish casualties numbered by the hundreds. But the revolt strengthened Jewish self-sufficiency. It further separated the Jewish and Arab economies, pushing Jews further develop their own services to replace those rendered by Arabs.[183]

Despite the revolt's outcomes for Palestinians, their resistance shaped Zionist antimalaria in the 1940s. During the revolt, Saliternik contemplated a more "synthetic" approach to malaria control given the lower costs of the activities inside the settlements compared to the costs of swamp drainage in the Jezreel Valley. Thus, "the doubt comes in heart, what is preferable over what:" combining swamp drainage with using chemicals and with antimalaria measures inside the settlements or keep relying mostly on swamp drainage.[184] As the basis for operations in 1940 Saliternik suggested a synthesis.[185] Additionally, he kept stressing the importance of education

which he saw as key for the future during the revolt in order to harness "the good will of the people"[186] for antimalarial activities.

Organizationally, Zionists formed the Central Antimalaria Committee in 1939 as a lesson from the revolt. The Committee was an elaboration of capacities developed during and as a response to Palestinian resistance. It did not centralize antimalaria[187] but was a "somewhat loose" organization whose primary function was "coordinating and supervising the anti-malaria work in the new areas of colonization."[188] The Committee formed in 1940 because when colonization expanded into malarious areas as a response to the revolt, "it was apparent… that the far-flung regions required a more extensive form of organization if effective control was to be established."[189] When Zionists contemplated a country-wide antimalaria agency in 1945, Saliternik showed how the Committee was a continuation of the capacities developed during the revolt: "during the last 8 years of work… a firm foundation was laid and an encompassing organization for the antimalarial operations was formed."[190]

Renewed Relations: British, Zionists and Antimalaria During World War II

Immediately after the revolt, Palestine faced World War II. British and Zionists cooperated on the political level against their mutual Nazi foe[191] and re-established their relations in the field of antimalaria. This collaboration was one of the reasons that morbidity remained low during the war and settlement could expand, despite the expected dangers that resulted from an increase in potential breeding places.[192]

Zionists advanced colonization while enjoying the access the British had to new and powerful insecticides. Four Jewish malariologists, including Mer, joined British forces, and served on multiple fronts.[193] One of them, Peretz Yekutiel, became the "chief malariologist of

Palestine and Transjordan" during the war.[194] In this role, Yekutiel tried to advance Zionist goals by instructing the drainage of swamps that were near military camps but also effected Jewish settlements.[195]

Under the heading "The Military's Operations and their Importance for our Settlements,"[196] Saliternik wrote that the British military had "unlimited resources" to undertake antimalarial operations, including a stock of the new efficient insecticide DDT. Without the military's assistance, several areas of Jewish settlement could have experienced a "pretty serious situation… we must mention with deep gratitude the excellent direct and indirect help of the military, headed by the vigilant and dedicated Major Yekutieli, to our settlements."[197] Beginning in 1938, Zionists broke into new "uninhabitable" locales around Haifa.[198] The military had camps in the area so it participated in the antimalarial operations.[199] In 1945 military aircrafts sprayed the region with DDT.[200] They were possibly sent by Yekutiel.[201]

Given their relations with the British and use of insecticides, malariologists suggested that the old political-economic problems malaria caused might soon become obsolete. In 1945 Zionists acquired DDT for the first time, after it was solely in the possession of the military. The Committee and the Malaria Research Station experimented with the material and with Hadassah's help ordered raw materials from the US to begin DDT production in Palestine.[202] The Committee formed a DDT service for which settlements paid and Mer used his experience in the British military to advise on using the insecticide. The results exceeded expectations: morbidity declined by about 75% and anopheles were almost gone. With DDT, "the malaria problem loses its usual acuteness. Colonization in new areas will not carry with it such immense financial losses because it will not be so dependent on the situation around the settlements."[203] To Mer, DDT opened new areas to colonization because it helped maintain a healthy population

even in highly endemic areas. He suggested DDT might make redundant the need for large-scale antimalarial operations before settlement.[204]

The 1948 War, Statehood, and Development

With these capacities, Zionist malariologists entered the 1948 War against the Palestinians and neighboring Arab countries. A supply of DDT helped prepare for the war as hostilities between Jews and Arabs increased.[205] Chaos ensued as the British departed from Palestine and stopped all antimalarial work. When Israel declared independence in May 1948 and a full-scale war began, all antimalarial workers were drafted to the newly formed Israeli military. Antimalaria was conducted under war conditions and amid immense population movements and demographic changes, including mass departure/banishment of Palestinians on the one hand and mass Jewish immigration into Israel on the other.[206]

Still, by the end of 1948 there were six antimalarial units with 80 fully equipped inspectors.[207] Antimalaria was finally centralized after the 1948 War, following almost two decades. It was the first health-related field to officially come under the authority of the new state with the creation of the antimalaria department, headed by Saliternik, within the ministry of health.[208]

With their newfound political power and while elaborating malaria control methods, malariologists entered the era of high Israeli developmentalism and participated in the urgent tasks of the period: colonization, immigration absorption and economic development.[209] Amid war-time chaos, colonization and the settling of Jewish immigrants took place in conquered territories with abandoned Arab towns and villages hitherto unstudied and untreated against malaria.[210]

Jewish ethnic hierarchies manifested themselves as malariologists viewed *Mizrahi* Jewish immigrants as potential sources of epidemiological danger, similarly to how they previously viewed Arabs. Saliternik claimed that many of the Jewish immigrants from the Balkans and Arab and Muslim countries brought malaria to Israel from their countries of origin. He also lamented their allegedly low "cultural level."[211] For him, they constituted "a grave danger" and "internal foci" of malaria that may risk the veteran (read, European) Jewish inhabitants.[212] Specifically, Saliternik mentioned Yemeni Jewish immigrants as malaria parasite carriers who are "putting in great danger the population around them."[213] He advised that immigrants' camps and settlements will be closely watched and sprayed with DDT more often than usual.[214]

Exemplifying the dynamics of Arab banishment, Jewish immigration, war, and malaria is the 5000-people Arab town Beisan that was conquered by Israeli forces during the war.[215] With some of its Arab inhabitants fleeing and others expelled, the town became the Jewish Beit She'an, home to some 1,500 Jewish Mizrahi immigrants. Saliternik complained that they dig irrigation canals for their own needs while disregarding public health instructions and while mosquitos find shelter in the city's ruins.[216] DDT and pharmaceuticals were used to reduce an increase in morbidity that could have forced the Jewish residents to leave.

Malaria control in urban areas such as Haifa and Jerusalem as well as in hilly Arab villages – formerly a British responsibility and now a responsibility of the new state – was challenging.[217] All records of the numerous cisterns in the cities and villages, which were important mosquito breeding places, were lost during the war. Given Palestinian banishment/departure, the Arab inspectors who cared for these cisterns as employees of the British administration were gone. The antimalaria department had to search and create a new map of all cisterns.

Some potential breeding places were in dangerous border zones or where landmines were placed. As happened with Arab villages nearby Jewish settlements in pervious years, antimalarial activities necessitated cooperation with neighboring Arab countries[218] because "mosquitos do not recognize political boundaries,"[219] as Saliternik wrote. The Jordanians cooperated with Israelis and undertook collaborative antimalarial efforts. A stone-throwing incident at the border clarified the Syrians were not interested.[220]

Economically, Israel was developing its water resources, yet such economic development increased the risk of malaria. It generated artificial swamps with increased mosquito breeding, sometimes higher than in natural swamps.[221] Reflecting on antimalarial operations for 1950, Saliternik considered these artificial swamps "the most important hazard from the perspective of antimalarial work."[222]

One source of economic development which increased the number of these artificial swamps was the expansion of agricultural production, including rice growing. An "extensive network of irrigation and water pipes"[223] stretching all over the country as well as water reservoirs created potential risks. The development and transportation of water to the Negev desert, a part of the Zionist ideological commitment to "making the desert bloom,"[224] created special challenges related to overseeing potential artificial breeding spots in such a vast area.[225]

Another booming industry was fish farming which developed since the end of the 1930s. It proved a constant antimalarial challenge. Already in 1939 Saliternik cautioned that economic development might also increase health hazards if malaria is not considered.[226] By 1945, fish farming extended over 12,000 dunams of land and by 1948 to over 20,000 dunums. Malariologists were only barely prevented epidemics caused by the expansion of this new industry.[227]

The rapid economic-industrial development fish farming entailed led Saliternik to advocate joint action by the ministry of health, ministry of agriculture, and the Fish Breeders Association. The purpose was to "instill in the public" the understanding that irresponsible use of water "causes a disaster to the country, degeneration, and annihilation to the people."[228] Therefore:

> Every person who enjoys water and makes their living out of it, must see to it, that his enterprise (*mif'alo*) be appropriately planned and approved by the ministry of health, and must maintain this enterprise according to the instructions of the ministry of health.[229]

To improve malaria control, Saliternik and an engineer conducted a meticulous country-wide *Survey of Water Sources for Antimalaria Treatment*. The survey included a preface by the Director General of the Israeli Ministry of Health, Shim'on Btesh, who echoed Saliternik's sentiment:

> Israel is now undertaking the enormous task of developing its water resources and bringing irrigation to the vast dry stretches of desert land in the South. Fish-ponds are being developed rapidly – a new industry in a new state. Water is the life of the land and no development is possible without it, but this blessing is not unaccompanied by danger and the risk of malaria looms ahead.[230]

Btesh hoped that the survey will be helpful to the defense forces, hikers, settlement activities and "those who plan and carry out the development and exploitation of the water resources of the country."[231]

The transition to statehood and the demands of Israeli developmentalism were straining. However, malariologists made extensive use of DDT, sometimes sprayed from airplanes, to curb morbidity and epidemic outbreaks. In 1949 for example, some 280 tons of DDT were used to

benefit over 132,000 people in Jewish and non-Jewish locales.[232] Malariologists also treated swamps with other chemicals to prevent epidemics and reduce morbidity. They also used pharmaceuticals, supervision, and instruction.[233] Their efforts were successful.

Conclusion

Malaria was one of the greatest foils of Zionist colonization. From the 1880s into the 1920s, the disease took the lives of many settlers, threatened the existence of settlements, jeopardized Jewish immigration, and caused significant political-economic problems. I have argued in this article that an antimalarial campaign was critical to the success of Zionist colonization and their creation of a developmental state.

Theoretically, I demonstrated that while malaria morbidity can thwart colonization, relations and ties between different groups inside and outside a colony are critical for overcoming disease and for settlement and development to proceed. These relations and ties determine the flow of critical resources into the target territory, shaping its political, social, and economic development. In this case, relations between the settlers, their diasporic community, and British rulers facilitated the flow of funds and scientific knowledge and expertise into Palestine and enabled colonization in malarious areas. The knowledge and expertise that flowed into the colony proved highly consequential, even after the relations that facilitated their flow have been altered or dissolved.

I also demonstrated the importance of local resistance for our understanding of the relationship between disease, colonization, and development. Palestinians were not passive agents. Their opposition to Zionism and British colonialism had a significant, lasting effect on Zionist antimalaria during and after the Arab revolt as the adjustments Zionist malariologists

made to deal with the new circumstances persisted after the revolt's suppression. Because of the revolt, malariologists turned to developing an 'anti-mosquito repertoire,' reconsidered their operations, and developed the organization of malaria control.

The MRU's antimalarial campaign was fundamental to Israeli developmentalism. By facilitating immigration and settlement on national land, the MRU helped the WZO-Labor alliance play out. This enabled Labor to gain power and form in Palestine the interventionist institutions it desired, infused with Eastern European political culture with its emphasis on collectivism and statism. The colonization of Jezreel Valley shows that the MRU's work was highly important for undertaking settlement schemes that came to define the Zionist-Israeli collectivity, produced potent national symbols, and further strengthened Labor power. After the disbandment of the unit, ex-MRU personnel such as Saliternik, Mer and others made important contributions to colonization, immigration absorption, the development of new industries and the exploitation of the Israel's resources.

This article shares some of the insights and sensitivities of previous studies of Zionist colonization, but also extends and complements them. First, I share the focus on colonization, political economy, and Labor's accumulation of power evident in the work of scholars such as Shafir and Kimmerling. However, I reject this vein's implicit anachronism and the backward projection of Labor power to the exclusion of other actors who contributed to state formation and colonization.[234] Second, I am sympathetic to studies who focused on capitalist development and British colonial economic policies. However, as other social scientists, my use of the concepts "development" and "developmentalism" is far more statist and relates to the settlers' nation state. Lastly, I made important empirical contributions to studies of Zionist health enterprises,

demonstrating the MRU's origins as a Rockefeller agency as well as the Arab revolt's important effect on everyday health conditions and activities.

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[1] Gershon Shafir, *Land, Labor and the Origins of the Israeli-Palestinian Conflict, 1882-1914* (Berkley, CA: University of California Press, 1996); Baruch Kimmerling, *Zionism and territory: The Socio-Territorial Dimensions of Zionist Politics* (Berkley, CA: Institute of International Studies, 1983); Baruch Kimmerling, *The invention and decline of Israeliness* (Berkley, CA: University of California Press, 2001); Caroline Elkins and Susan Pedersen, "Settler Colonialism: The Concept and its Uses," in Caroline Elkins and Susan Pedersen *Settler Colonialism in the Twentieth Century* (New York, NY: Routledge, 2005).

[2] Chalmers Johnson, *Miti and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975* (Stanford: Stanford University Press, 1982); Alice Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (New York: Oxford University Press, 1989); Joel Migdal, *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World* (Princeton, NJ: Princeton University Press, 1988); Atul Kohli, State Directed Development: Political Power and Industrialization in the Global Periphery (New York: Cambridge University Press, 2004); David Levi-Faur, "The Developmental State: Israel, South Korea and Taiwan Compared," *Studies in Comparative International Development* 33, no. 1 (1998): 65-93; Gershon Shafir and Yoav Peled, "Introduction: The Socioeconomic Liberalization of Israel," in Gershon Shafir and Yoav Peled, eds., *The New Israel: Peacemaking and Liberalization* (Boulder, CO: Westview Press, 2000); Erez Maggor, "The Politics of Innovation Policy: Building Israel's 'Neo-developmental' State," *Politics & Society* 49, no. 4 (2020): 451-487.
Along the paper, I use of the terms "development," "developmental" or "developmentalism" to refer to the emerging Israeli developmental state. In this sense, my conception of development is statist, not capitalist.

[3] Michael N. Barnett, "The Politics of Uniqueness: The Status of Israeli Case," in Michael N. Barnett, ed., *Israel in Comparative Perspective: Challenging the Conventional Wisdom* (Albany, NY: State University of New York Press, 1996); Levi-Faur, "Developmental;" Shafir and Peled, "Introduction."

[4] Joel Migdal, *Strong Societies*. Yonathan Shapiro, *The Formative Years of the Israeli Labor Party* (London: Sage, 1976).

[5] Shafir, *Land*; Migdal, *Strong*.

[6] Kimmerling, *Invention*; Shafir and Peled, *Introduction*; Levi-Faur, "Developmental;" Anita Shapira, *Israel: A History* (Waltham, MA: Brandeis University Press, 2012); Arie Krampf, "Reception of the Developmental Approach in the Jewish Economic Discourse of Mandatory Palestine, 1934–1938," *Israel Studies* 15, no. 2 (2010): 80-103.

[7] Shapira, *Israel*; Levi-Faur, "Developmental;" Erez Maggor, "Sources of State Discipline: Lessons from Israel's Developmental State," *Socio-Economic Review* 19, no. 2 (2016): 553-581. During its first twenty-five years, Israel's industrialization and growth rates were remarkable, on par with other cases of 'miraculous' development. Levi-Faur, "Developmental." As example for growth rates see p. 66 for Israel's Gross National Product during 1951-1973.

[8] Moshe Smilansky, *Hadera* (Tel Aviv: Omanut, 1935); Hilell Yaffe, *Dor Ma'apilim* (Jerusalem: Hasifria HaTzionit, 1971); Artur Ruppin, *The Agricultural Colonization of the Zionist Organization in Palestine* (Westport, CT: Hyperion Press, 1976 [1926]).

[9] Daron Acemoglu, Simon Johnson, and James Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation," *The American Economic Review* 91, no. 5 (2001): 1369–1401; Daron Acemoglu, Simon Johnson and James A. Robinson, "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution," *The Quarterly Journal of Economics* 117 no. 4 (2002): 1231-1294, see esp. 1266; Daron Acemoglu, Simon Johnson and James A. Robinson, "Disease and Development in Historical Perspective," J*ournal of the European Economic Association* 1, no. 2-3 (2003): 397– 405, esp. 403; Daron Acemoglu and James Robinson, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* (New York: Crown, 2012, esp. 260, 274). According to Google Scholar, as of April 23, 2023, "Origins" was cited 16,979 times; *Why Nations Fail* was cited 14,562 times; and "Reversal" was cited by 6,935.

[10] Lange, *Lineages,* 198.

[11] On the influence of this Acemoglu, Johnson and Robinson see: Jocelyn Viterna and Cassandra Robertson, "New Directions for the Sociology of Development," *Annual Review of Sociology* 41 (2015): 243-269; Stanley L. Engerman and Kenneth N. Sokoloff, "Debating the Role of Institutions in Political and Economic Development: Theory, History, and Findings," Annual Review of Political Science 11 (2008): 119-135, esp. 128; James Mahoney, *Colonialism and Postcolonial Development: Spanish America in Comparative Perspective* (New York, NY: Cambridge University Press, 2010, 17-20);. Scholars generally accepted AJR's assertions, with some exceptions.

See Matthew Lange, James Mahoney and Mathias vom Hau, "Colonialism and Development: A Comparative Analysis of Spanish and British Colonies," *American Journal of Sociology* 111, no. 5 (2006): 1412-1462.

[12] Acemoglu, Johnson, Robinson, "Origins."

[13] Sandra Sufian, *Healing the Land and the Nation: Malaria and the Zionist Project in Palestine, 1920-1947* (Chicago, IL: University of Chicago Press, 2007, 190).

[14] Sufian, *Healing*, 217.

[15] E.g., Kimmerling, *Zionism*, *Invention*; Ronen Shamir, *Colonies of Law: Colonialism, Zionism and Law in Early Mandate Palestine* (Cambridge, UK: Cambridge University Press, 2000); Dafna Hirsch, 'We Are Here to Bring the West:' Hygiene Education and Culture Building in the Jewish Society of Mandate Palestine (Sede Boqer: Ben Gurion Research Institute, 2014, Hebrew); Fredrik Meiton, *Electrical Palestine: Capital and Technology From Empire to Nation* (Oakland: the University of California Press, 2019); Rashid Khalidi, *The Hundred Years' War on Palestine: A History of Settler Colonialism and Resistance, 1917-2017* (New York: Metropolitan Books, 2017).

[16] Shafir, *Land*.

[17] Kimmerling, *Invention*, 65. Migdal, *Strong*; Shapira, *Israel*.

[18] Shafir, *Land*; Kimmerling, *Zionism*, *Invention*; Migdal, *Strong*.

[19] Shafir, *Land*.

[20] Shafir, *Land*.

[21] E.g., Migdal, *Strong*, 155, 157; Shafir, *Land*; Kimmerling, *Invention*.

[22] Migdal, *Strong*; Kimmerling, *Invention*, 66.

[23] Migdal, *Strong*; Shafir and Peled, "Introduction;" Levi-Faur, "Developmental;" Kimmerling, *Invention*; Shapira, *Israel*; Krampf, "Developmental," 98.

[24] Gil Eyal, *The Disenchantment of the Orient: Israeli Expertise in Arab Affairs* (Stanford, CA: Stanford University Press, 2006, 37-38).

[25] Nahum Karlinsky, "California Dreaming: Adapting the 'California Model' to the Jewish Citrus Industry in Palestine, 1917-1939," *Israel Studies* 5 (1): 24-40.

[26] Fredrik Meiton, "The Radiance of the Jewish National Home: Technocapitalism, Electrification, and theMaking of Modern Palestine," *Comparative Studies in Society and History* 57, no. 4 (2015): 975-1006; Jacob Norris,

"Transforming the Holy Land: The Ideology of Development and the British Mandate in Palestine," *Humanity: An International Journal of Human Rights* 8, no. 2 (2017): 269-286.

[27] Norris, "Transforming."

[28] Meiton, "Radiance."

[29] Johnson, *MITI*; Amsden, *Asia's*; Kohli, *State-Directed*.

[30] E.g., Dafna Hirsch, ""Interpreters of Occident to the Awakening Orient": The Jewish Public Health Nurse in Mandate Palestine," *Comparative Studies in Society and History* 50, no. 1 (2008): 227-255; Hirsch, *We*.

[31] Sufian, *Healing*.

[32] Lange, Mahoney, vom Hau, "Colonialism," 1413.

[33] Elkins, Pedersen, "Settler Colonialism."

[34] Such as the books Ruppin, *Colonization*; Avraham Granovsky, *Land Problems in Palestine* (London: Routledge, 2016 [1926]).

[35] Shafir, *Land*, 1-6.

[36] Ernest W. Gurney Masterman, *Studies in Galilee* (Chicago, IL: The University of Chicago Press, 1909, 103); E. W. G. Masterman, *Hygiene and Disease in Palestine: In Modern and in Biblical Times* (London: Palestine Exploration Fund, 1920, 13); Sufian, *Healing*, 99-100.

[37] Israel Kligler, *The Epidemiology and Control of Malaria in Palestine* (Chicago, IL: The University of Chicago Press, 1930, viii.

[38] Aharon Ben Barak, *Beshviley Mechora* (Merhavia, 1972, 13) CZA library; Nahalal, "Kvi'at Makom Hamoshav," in Yosef Shapira, ed., *Nahalal: Darko, Hithavuto, Poalo* (Tel Aviv: Am Oved, 1947, 97-102) CZA library.

[39] Smilansky, *Hadera*, 45.

[40] Moshe Smilansky, *Prakim Betoldot HaYeshuv*, vol. 1 (Tel Aviv: Dvir, 1959, 19-20).

[41] Israel Kligler, Joseph Shapiro, and I. Weitzman, "Malaria in Rural Settlements in Palestine," *Journal of Hygiene* 23 (1924): 280–316.

[42] Shafir, *Land*, 20.

[43] Ruppin, *Colonization*, 9.

[44] Kligler, *Epidemiology*, viii.

[45] Shmuel Dayan, *Kfar Nahalal* (Tel Aviv: Kupat Hasefer, 1926, 20, and 11, 21, 23, 24). Israel National Library.

[46] David Ben Gurion, *Memoires* (New York: World Publishing, 1970, 50-53); Yizhak Ben Zvi, *Rishmei Derech* (Jerusalem: Yad Yizhak Ben Zvi, 1972, 10, 49).

[47] Shmuel Dayan, *The Promised Land*, Yael Dayan, ed., (London: Routledge, 1961); Anita Shapira, *Berl: An Autobiography of a Socialist Zionist, Berl Katznelson 1887-1944* (Cambridge: Cambridge University Press, 2008, 34); Sufian, *Healing*, 88.

[48] Sufian, *Healing*, 79; Boaz Neumann, *Pioneers' Passion: Land and Desire in Early Zionism* (Waltham, MA: Brandeis University Press, 2011, 139).

[49] Rachel Yanait Ben Zvi, *Coming Home* (New York: Herzl Press, 1964, 103).

[50] Yosef Rabinovitch, "Hako'opertzia beMerhavia," in Eliezer Lubrani, ed., *Sefer Merhavia Haco'opertzia* (Tel Aviv: Vatikei Hacoopertzia Publishing, 72-90, 75, 83 ,84 ,89) CZA library; Kligler, *Epidemiology*, viii.

[51] Kligler, *Epidemiology*, viii.

[52] Ruppin, *Colonization*, 60-62.

[53] Granovsky, *Land*, 79.

[54] Granovsky, *Land*, 84.

[55] Ruppin, *Colonization*, 161-163.

[56] Granovsky, *Land*, 81.

[57] Shapira, *Israel*, 62, 70.

[58] Shapira, *Israel*, 37.

[59] Shapira, *Israel*, 36.

[60] Shapira, *Israel*, 70-76.

[61] Kimmerling, *Invention*, 29; Shapira, *Israel*, 70, 73.

[62] Barbara J. Smith, *The Roots of Separatism in Palestine: British Economic Policy, 1920-1929* (Syracuse, NY: Syracuse University Press, 1993, 6).

[63] Shapira, *Israel*, 94-95.

[64] Sufian, *Healing*, 9.

[65] Shapira, *Israel*, 94-95.

[66] David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth Century India* (Berkley, CA: University of California Press, 1993).

[67] Sufian, *Healing*, 8-11.

[68] Sufian, *Healing*, 192; Norris, "Transforming."

[69] Sufian, *Healing*. Already before the unit, some Jewish-Zionist malariologists in Palestine were trained in modern malariology and (unsuccessfully) tried to centralize antimalaria. Yaffe, *Dor*, 289-291, 299, 329. However, many of their colleagues adhered to outdated science. Sufian, *Healing*, 80-81.

[70] Sufian, *Healing*.

[71] Louis Brandeis, *Louis Brandeis: An Autobiographical Sketch*, Jacob de Haas, ed. (New York: Bloch, 1929, 121, 183).

[72] Morris Ruthenberg, "The Medical Unit: Its Work and Its Problems." *The New Palestine*, July 15th, 1921; David Kalisky, "Its Significance," *The New Palestine*, December 30th, 1921.

[73] Brandeis, *Autobiographical*, 252, 260, 288, 293).

[74] Kligler, *Epidemiology*, ix.

[75] "Department of Health, Palestine, Malaria Research Unit, Annual Report 1925." JDC, folder 284. Herefater: *MRU 1925*.

[76] Kligler, *Epidemiology*, ix; Sufian, *Healing*.

[77] Kligler, *Epidemiology*, 113-116.

[78] "Antimalaria and Drainage Work Done by Jewish Bodies, Memorandum Submitted to the Palestine Royal Commission on Behalf of the Jewish Agency," p. 11-12. JDC, folder 291. Hereafter, *Antimalaria and Drainage*.

[79] Rose Jacobs, "Beginnings of Hadassah," in Isidor Meyer, ed., *Early History of Zionism in America* (New York: American Jewish Historical Society and Theodore Hertzl Foundation, 1958, 228-244, p. 239).

[80] Julian Mack to Nathan Strauss, February 10th, 1921. CJH, I-578, 2, box 48, folder 8.

[81] E.g., Rose to Flexner, December 3rd, 1921; letter to Kligler, December 5th, 1921; Flexner to John A. Ferrell, June 26th, 1922; letter to Judge Julian Mack, October 11th, 1921. JDC, file 279; Vice Chairman to Mack, March 10th, 1921, JDC, file 275.

[82] "Report on sanitation in Palestine prepared by Dr. Israel Kligler, Rockefeller Institute, New York, 1918." CZA/J15/7212, p. 48. Hereafter: Kligler, *Report on Sanitation*. Kligler maintained his connections to the RF throughout his time in the country.

[83] Nancy Stepan, *Eradication: Ridding the World of Diseases Forever?* (Ithaca, NY: Cornell University Press, 2011).

[84] Israel Kligler, "Malaria control demonstrations in Palestine," *American Journal of Tropical Medicine* 4, no. 2 (1924): 139–174, pp. 139-140. Hadassah Medical Organization, *Third Report*, September 1920 – December 1921, p. 9. CZA/SOK/91527. Hereafter *HMO Third Report*.

[85] Bernard Flexner to the High Commissioner of Palestine, May 9th, 1922. JDC, file 279.

[86] Henrietta Szold, letter from Jerusalem, October 7th, 1921. Marvin Lowenthal, *Henrietta Szold: Life and Letters*. (Viking Press, 1942, 194).

[87] Sufian, *Healing*, 194.

[88] The Rockefeller Foundation, *International Health Board, Seventh Annual Report, January 1, 1920 – December 31, 1920*, p. 15.

[89] Simon Flexner, "Wickliffe Rose: 1862–1931," *Science* 75 (1950): 504–506, p. 505; The Rockefeller Foundation, *International Health Board, Fourth Annual Report, January 1, 1917 – December 31, 1917*, p. 45-46. Hereafter, RF, IHB*, Fourth Annual Report*.

[90] Sufian, *Healing*, 209.

[91] Sufian, *Healing*, 8-9, 194.

[92] Kligler, *Report on Sanitation.*

[93] Sufian, *Healing*, 80-81.

[94] Kligler, *Report on Sanitation;* Israel Kligler, "Quinine Prophylaxis and Latent Malaria Infection," *Transactions of the royal society of tropical medicine and hygiene* 17, no. 4 (1923): 259-262.

[95] See Kligler, *Epidemiology*, and all MRU reports.

[96] Sufian, *Healing*.

[97] RF, IHB*, Fourth Annual Report*, p. 45.

[98] Kligler, Shapiro, Weitzman, "Malaria," 280, 283; Kligler, *Epidemiology*, 87-88).

[99] See MRU annual reports. See also Kligler, Shapiro, Weitzman, "Malaria;" Kligler, *Epidemiology*.

[100] I. J. Kligler and I. Wetizmann, 1922. *Malaria Control Demonstration in Palestine*, p. 52. CJH, I-578, 2, 46, 5.

[101] Kligler, "Control Demonstrations," 145.

[102] Kligler, "Control Demonstrations," 145.

[103] Kligler, *Epidemiology*, viii-ix.

[104] Shapira, *Israel*, 107.

[105] Shapira, *Israel*, 107-108.

[106] Shafir, *Land*.

[107] Shapira, *Israel*, 109.

[108] Shapira, *Israel*, 110.

[109] Shapira, *Israel*, 110; Shapiro, *Formative*; Migdal, *Strong*.

[110] Shapira, *Israel*, 110.

[111] Shapira, *Israel, 110*; Kimmerling, *Zionism*, 90.

[112] Shapira, *History*, 108.

[113] "Report of Dr. Israel Kligler for the Year Ending August 31st, 1923," p. 18. JDC, Folder 282. Hereafter, *Report of Dr. Israel Kligler*.

[114] Yosef Weitz, *Hitnachlutenu Betkofat Hasa'ar* (Merhavia, 1947, 66).

[115] Weitz, *Hitnachlutenu*, 66-69.

[116] *Report of Dr. Israel Kligler*, p. 18. See also Kligler, Shapiro, Weitzman, "Malaria," 310.

[117] Weitz, *Hitnachlutenu*, 68, 70; Yosef Breuer, "Yibush Venikuz," in Yosef Shapira, ed., *Nahalal: Darko, Hithavuto, Po'alo* (Tel Aviv: Am Oved, 57-72, pp. 58-59) CZA library.

[118] *Report of Dr. Israel Kligler*, p. 19.

[119] Granovsky, *Land,* 80.

[120] Kligler, *Epidemiology*, 202.

[121] *Antimalaria and Drainage*, 11-12.

[122] J. Elazari-Volcani, "Jewish Colonization in Palestine," *Annals of the American Academy of Political and Social Science* 164, no. 1 (1932): 84-94.

[123] *MRU 1925*.

[124] Kligler, *Epidemiology*, 202.

[125] *MRU 1925*.

[126] Kligler, Epidemiology, ix-x; "Proposals for the Continuation of the Malaria Research Unit." March 20th, 1924. JDC, 279. Kligler was not the only doctor advocating the precedence of malaria control over settlement, but his

actions seem to be the most fruitful in getting the colonizing agencies to understand the significance of this principle.

[127] "Minutes of a Conversation between Dr. Kligler, Controller of the Malaria Research Unit and Dr. A. Ruppin on the Question of Antimalarial and Sanitary Work in Jewish Settlements in the Country," February 20th, 1925. CZA/S15/21973.

[128] Granovsky, *Land*, 80; Ruppin, *Colonization*, 61; Elazari-Volcani, *Jewish Colonization*, 84.

[129] See below, as well as Sufian, *Healing*, 199-202.

[130]Sufian, *Healing*.

[131] Kligler to Heron, 1.31.1927. JDC, Folder 280; Kligler to Flexner, 4.3.1928. JDC, folder 280.

[132] RF, IHB, *Fourth Annual Report*, p. 45-46.

[133] RF, IHB, *Seventh Annual Report*, p. 2-3.

[134] Zvi Saliternik, *Korot Hamilhama Bakadahat BeEretz Israel Vehadbarata, Kovetz Prakim Betoldot HaYishuv* (Jerusalem: Israeli Institute of the History of Medicine, 1979, 88); Zvi Saliternik, "The Antimalarial Work and an Analysis of Malaria Morbidity in the Year 1937 in the Blocks of Jezreel Valley, Bet She'an Valley, Jordan Valley and the Lower Galilee," p. 2. CZA/J1/1726. Hereafter: Saliternik, *Antimalarial Work 1937*; see Dr. Shapiro's role in "Memorandum on Cooperation Between the Government Health Service and the Health Committee of the Vaad Leumi," p. 4. CZA/J1/1646.

[135] Saliternik, *Korot*, 89.

[136] "Report of the Committee for the Determination of Ways and Means to Conduct the Anti-Malarial Work (Vaad Habriut meeting 8.2.28)." CZA/J1/6371. Hereafter: *Ways and Means*.

[137] Kligler to Flexner, April 3rd, 1928. JDC, file 280. Vaad Habriut assembled a committee to determine how to organize antimalarial work. *Ways and Means,* and "Proposals on Antimalarial Means to be Conducted in Hebrew Colonies, Prepared by the Subcommittee of Vaad Habriut." Hereafter: *Proposals*; S. Peller, "The Malaria Situation in 1927." CZA/J1/6371; "Suggestions of the Committee on the Questions of Malaria in the Summer of 1929. Meeting of February 21st, 1929." CZA/J1/7730.

[138] Shapira, *Israel*.

[139] Saliternik, *Antimalarial Work 1937*, p. 2.

[140] Vaad Leumi, *Memorandum Submitted to the Palestine Royal Commission* (Jerusalem, 1936). National Library of Israel.

[141] Vaad Leumi, *Memorandum Royal Commission*. "Towards the Malaria Season. An Announcement by the Health Secretariat of the Palestine Zionist Executive," 1929? CZA/J1/7730.

[142] Saliternik, *Korot*.

[143] A. Katznelson, Vaad Leumi, to the General Secretary of the Palestine Government, "Summer Epidemic 1934," CZA/J1/1646, and other documents in that file.

[144] Vaad Leumi, *Memorandum Royal Commission*, 30, 57.

[145] Sufian, *Healing*, 303-309.

[146] See Dayan, *Kfar*.

[147] Benny Morris, *Righteous Victims: A History of the Zionist-Arab Conflict, 1881-2001* (New York: Vintage Books 2001, 150); Charles Anderson, "When Palestinians Became Human Shields: Counterinsurgency, Racialization, and the Great Revolt (1936–1939)," *Comparative Studies in Society and History* 63, no. 3 (2021): 625-654.

[148] Morris, *Righteous*; Anderson, *Palestinians*.

[149] Weitz, *Hitnachlutenu*, 25-27; Anita Shapira, *Land and Power: The Zionist Resort to Force, 1881-1948* (Stanford, CA: Stanford University Press, 1992, 253).

[150] Sufian, *Healing*, 309.

[151] Sufian, *Healing*, 95, 309-311.

[152] "Regarding: 1) patients with infectious diseases 2) the malaria question." Dr. Meir to government ministry of health, Jaffa, May 7th, 1936; Dr. A. Katznelson to Director of government health department, May 8th, 1936, CZA/J1/1542; Z. Saliternik, "Review of Antimalarial Control in 1939," p. 5-6, January 18th, 1940. CZA/J1/1825; Saliternik to Kupat Holim, overview of malaria and its control in the districts Yavniel-Bet Gan, Jordan Valley settlements, Nurris Valley, Afulah and its vicinity and Nahalal and its vicinity. April 21st, 1937. CZA/J1/1726. Hereafter: Saliternik, *Overview 1937*. The Revolt also curbed British attempts to prevent breeding in the swamps. See evidence from Hefer Valley: Senior medical officer, Haifa District to Director medical services, 9.5.1936; Director medical services to S.M.O Haifa, 5.9.1936, ISA/M/5128/12.

[153] Saliternik, *Antimalarial Work 1937*, p. 4; Saliternik, "Overview of Antimalarial Work in Jezreel Valley, Bet She'an Valley and Parts of the Lower Galilee and Jezreel Valley in 1938," p. 15. CZA/J1/1726. Hereafter, Saliternik *Overview 1938*.

[154] Saliternik, to Kupat Holim, Settlement Department, Health Council, Mr. Weitz – JNF. "Report on a Visit to the New Settlements with Mr. Makler, Representative of the Settlement Department." August 28, 1938. CZA/J1/1726.

[155] Saliternik, *Antimalarial Work 1937*, p. 4; See Saliternik's reference to defense actions (*Pe'ulot*): Saliternik, *Review 1939*.

[156] Saliternik, *Overview 1938*, p. 14.

[157] Saliternik also suggested that the hostilities lessened the potential for infecting Jews with malaria since Bedouin Arabs did not come near the settlements as in peace times. Saliternik, *Overview 1938*, p. 14. CZA/J1/1726.

[158] Saliternik, *Overview 1938*, p. 14.

[159] E.g., Zvi Saliternik, *Hamilhama BaAnopheles – Ma'avir Hamalaria* (Tel Aviv, 1933).

[160] Dr. Y. Meir to Saliternik, May 17th, 1937. CZA/J1/1726. Those institutions were the Jewish Agency, JNF, Sick Fund. The Health Council was also involved. See correspondence on financing the antimalarial supervision, e.g.: A. Katznelson to treasurer of the Jewish Agency, September 16th, 1938; Soroka to health department of Vaad Leumi, October 13th, 1938; Katznelson to Kaplan, October 27th, 1938. CZA/J1/1825.

[161] Saliternik to Kupat Holim, April 23rd, 1937. CZA/J1/1726.

[162] In 1937, Saliternik wrote and received over 500 letters in about 8 months; In 1938, he wrote and received over 600 letters and reports; In 1939, Saliternik wrote 254 letters and received 305. Saliternik, *Antimalarial Work 1937* p. 9; Saliternik, *Overview 1938*, p. 4; Saliternik, *Review 1939*, p. 1.

[163] Saliternik, *Review 1939*, p. 15.

[164] Saliternik, *Korot*, 94.

[165] Z. Saliternik, "Report on the Situation of Antimalarial Work in the Block Nahalal, Afulah, Jezreel Valley, Bet She'an Valley and Yavniel-Bet Gan 14.10.37-14.11.37 (and Jordan Valley)," p.1. CZA/J1/1726; Saliternik, *Overview 1938*, p. 2.

[166] "The Situation in Nuris." Saliternik, *Overview 1937*.

[167] Saliternik, *Review 1939*, p. 3.

[168] This was an instruction by Saliternik himself. "Personal Protection from the Danger of Malaria!!," Saliternik, *Overview 1937*; Saliternik, *Korot*, 95.

[169] E.g., Hirsch, *We*; Hirsch, "Interpreters."

[170] Saliternik, "Circular [*Hozer*] 1," to the settlements: Tirat Zvi, Tel Amal, Beit Yosef, Maoz, etc; "to the members of Tel Amal" August 3rd, 1937; Saliternik to Kupat Holim, August 12th, 1937, letter on insecticide "flit." CZA/J1/1726.

[171] "Personal Protection from the Danger of Malaria!!," Saliternik, *Overview 1937*.

[172] Saliternik to Kupat Holim, August 12th, 1937, letter on mosquito repellent. CZA/J1/1726.

[173] Z. Saliternik, *Review 1939*, p. 3.

[174] Saliternik, *Antimalarial Work 1937*, p. 18.

[175] Z. Saliternik, "Overview of the Situation and Antimalaria Work in Bet She'an Valley, Jordan Valley and part of Jezreel Valley and the Galilee in October 1938," p. 6, November 11th, 1938. CZA/J1/1726; Saliternik, *Overview 1938*, p. 2.

[176] Z. Saliternik, "Report on the Situation of Antimalarial Work in the Areas of Nahalal, Afulah, Nuris, the Valleys of Bet She'an and Jordan and Yavniel-Bet Gan, 14.8.37-14.9.37." CZA/J1/1726.

[177] Other Zionist health campaigns shared this view. Hirsch, *We*; Hirsch, "Interpreters."

[178] "Towards the Malaria Season. An Announcement by the Health Secretariat of the Palestine Zionist Executive," 1929? CZA/J1/7730.

[179] Saliternik, "to the members of Tel Amal" August 3rd, 1937. CZA/J1/1726.

[180] Saliternik, "Circular 1," to the settlements: Tirat Zvi, Tel Amal, Beit Yosef, Maoz, etc; "to the members of Tel Amal" August 3rd, 1937; Saliternik to Kupat Holim, August 12th, 1937. CZA/J1/1726.

[181] Saliternik, "to the members of Tel Amal," August 3rd, 1937, CZA/J1/1726. See also Saliternik, "Circular 1," to the settlements: Tirat Zvi, Tel Amal, Beit Yosef, Maoz, etc. CZA/J1/1726.

[182] Rashid Khalidi, *Palestinian identity: The construction of Modern National Consciousness*. New York: Columbia University Press, 1997, p. 190); Morris, *Righteous*, 159-160.

[183] Morris, *Righteous*, 160; Khalidi, *Palestinian*, 190.

[184] Saliternik, *Overview 1938*, p. 16.

[185] Saliternik, *Review 1939*, p. 14-16.

[186] Saliternik to the Central Antimalarial Commission, December 21st, 1945. CZA/J1/2287. See also: Z. Saliternik, "The Situation and Antimalarial Operations in the Year 1945." CZA/J1/2287. Hereafter: Saliternik, *Situation 1945*; Saliternik, "Overview of the Situation and Antimalaria Activity in the First Half of 1945." CZA/J1/2287.

[187] Saliternik, *Situation 1945*, p. 3.

[188] "Introduction," stamp-dated May 1940s? CJH, I-578, 2, 46, 5. A memorandum from 1946 mentions a few bodies undertaking and supervising antimalarial work. It appears that the Central Antimalarial Committee had a liaison to the inspectors that worked in various districts under certain companies and local bodies. Vaad Leumi, *Memorandum submitted to the Anglo-American committee of inquiry on Palestine* (1946). Some local inspectors also resisted any infringement on their autonomy. Yollos to Barochov, "Antimalarial Commission – Our Conversation from 25.4.45," April 29th, 1945. CZA/KKL5/13720.

[189] "Introduction," stamp-dated May 1940s? CJH, I-578, 2, 46, 5.

[190] Saliternik to Central Antimalarial Commission, December 21st, 1945. CZA/J1/2287.

[191] Shapira, *Israel*, 88.

[192] Zvi Saliternik, *Din Veheshbon Leshnat 1946*. Mahleket Habriut Shel HaVa'ad HaLeumi, Hava'ada Ha'antimalarit Hamerkazit (1947).

[193] Vaad Leumi, *Memorandum Anglo-American*.

[194] Uri Dromi, "Halochem Beyatush Ha'Anopheles." *Haaretz*, December 10th, 2007. https://www.haaretz.co.il/misc/1.1464216, last accessed April 29, 2022.

[195] Dromi,"Halochem."

[196] Or: "Avodot Hatzava ve Hasivutan Lemiskenu." Saliternik, *Situation 1945*, p. 6.

[197] Saliternik, *Situation 1945*, p. 6.

[198] Kligler, "Report on the Malaria Control in 1942." CJH, I-578, 2, 46, 5. Hereafter: *Report 1942*.

[199] *Report 1942*; On location of military camps see Saliternik, *Situation 1945*, p. 6.

[200] Saliternik, "Overview of the Situation and Antimalaria Activity in the Months July-September 1945," p. 4. CZA/J1/2287.

[201] Dromi, "Halochem." See also Saliternik, *Situation 1945*, p. 6.

[202] Saliternik, *Din Veheshbon*, 24.

[203] Saliternik, *Din Veheshbon,* 31.

[204] Saliternik, *Din Veheshbon.*

[205] Saliternik to health department, Vaad Leumi, January 26th, 1948; Saliternik to regional antimalarial inspectors, January 19th, 1948. CZA/J1/8400.

[206] Zvi Saliternik, *Skira Shnatit Shel HaMachlaka Ha'Antimalarit (1949)* (Yerushalaim: Misrad Habriut, 1950); Zvi Saliternik, *Skira le'asor hamedina, 1948-1957* (Medinat Yisrael, Misrad Habriut, Hamachlaka Ha'antimalarit, 1958?); Z. Saliternik, Ministry of Health, *Skira Shel HaMachlaka Ha'Antimalarit Lashanim 1950-1952* (Jerusalem, 1953).

[207] Saliternik, *Skira 1949*; Saliternik, *Skira 1948-1957*.

[208] Saliternik, *Skira Shnatit*; Zvi Saliternik, "Hahesegim Beshithei Hamilhama Bamalaria, Bilhartzia Veyatushim Be'esrim Shnot Kium Hamedina," *Briut Htzibur* (1968): 89-96, p. 89.

[209] See Shapira, *Israel*.

[210] Saliternik, *Skira 1949*, 2; Saliternik, *Skira 1950-1952*, 2; Saliternik, *Skira 1948-1957*, 2.

[211] Saliternik, *Skira 1950-1952,* 2.

[212] Saliternik, *Skira 1949*, 73; Saliternik, *Skira 1950-1952*, 2.

[213] Saliternik, *Skira 1949*, 73.

[214] Saliternik, *Skira 1949*, 75.

[215] Benny Morris, *The Birth of the Palestinian Refugee Problem, 1947-1949 Revisited* (Cambridge: Cambridge University Press, 2004, 226-228).

[216] Saliternik, *Skira 1949*, 72.

[217] Saliternik, *Skira 1949*, 43.

[218] Saliternik, *Skira 1949*, 43.

[219] Saliternik, *Skira 1950-1952*, 1.

[220] Saliternik, *Skira 1948-1957*, 7.

[221] E.g., Saliternik, *Skira 1949*, 18-19.

[222] Saliternik, *Skira 1949*, 75.

[223] Saliternik, *Skira 1950-1952*, 6.

[224] Shapira, *Israel*, 150.

[225] Saliternik, *Skira 1949*, 74-75; Saliternik, *Skira 1950-1952*, 6.

[226] Saliternik, *Review 1939*, 14.

[227] Saliternik, *Din Veheshbon*, 14; Saliternik, *Skira 1949*, 47.

[228] Saliternik, *Skira 1949*, 75.

[229] Saliternik, *Skira 1949*, 75.

[230] Btesh, "Preface." In Z. Salinterik and M. Javor, *Survey of Water Sources for Antimalaria Treatment*, State of Israel, Ministry of Health, Antimalaria Department.

[231] Btesh, "Preface."

[232] Saliternik, *Skira 1949*, 49-63.

[233] Saliternik, *Skira 1949*; Saliternik, *Skira 1950-1952*; Saliternik, *Skira 1948-1957*.

[234] Eyal, *Disenchantment*, 37-38.