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World Food Programme

COVID-19 Vaccine Inequities and Hesitancy in Iraq

Results from June, July, and August 2021 Rounds of
Iraq High Frequency Phone Survey (IHFPS)

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Acronyms

CEPI - Coalition for Epidemic Preparedness Innovations

CFSVA - Comprehensive Food Security and Vulnerability Analysis

FCS - Food Consumption Score

IDPs - Internal Displaced Peoples

IHFPS - Iraq High Frequency Phone Survey

MENA - Middle East and North Africa

MICS - Multi Indicator Cluster Survey

MNOs - Mobile Network Operators

mVAM - mobile Vulnerability Analysis and Mapping

PSM - Propensity Score Matching

WFP - World Food Programme

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Executive Summary

While Iraq continues to experience a surge in the number of coronavirus cases, the proportion of the country's population that is vaccinated remains very low. According to data from Our World in Data, as of mid-January 2022, only 15 percent of Iraqis were fully vaccinated, and another 7 percent were partially vaccinated against Covid-19. These numbers are among the lowest in the Middle East and North Africa (MENA) region and are well below the global vaccination rates of 51 and 10 percent fully and partially vaccinated.

For a more in-depth understanding of the state of vaccination in Iraq, this note presents findings on Covid-19 vaccination disparities and hesitancy from the last three rounds of the Iraq High Frequency Phone Survey (IHFPS) conducted between June and August 2021. Starting in August 2020, the World Bank collaborated with the World Food Programme (WFP) and implemented nine (9) rounds of the IHFPS as part of the WFP's monthly mVAM survey. More than 1,600 adults from across Iraq (nationally representative) were interviewed in each round using mobile phones. The survey included several socioeconomic modules in addition to the WFP's food security module to assess the evolving situation during the pandemic. The last three rounds of the survey also included a module on Covid-19 vaccination to monitor vaccine distribution and acceptance in the country.

Findings from the survey suggest a low but increasing vaccination trend among adult Iraqis, however, resistance to the vaccine remain high. With the Delta variant surge in the country, share of Iraqis 18 years and above with at least the first dose of the Covid-19 vaccine doubled between June and August. While another one third were planning to receive the vaccine, the majority (51.9 and 43.6 percent in June and August) were either undecided or were not planning to receive the vaccine. Lack of knowledge about availability did not appear to be a problem as almost all the unvaccinated adults were aware and had knowledge of where to get the vaccine.

Fear and mistrust towards the Covid-19 vaccine risks to undermine the efficacy of the country's vaccination campaign. The majority of those who are reluctant to the vaccine are worried about its side effects. More than half (51 percent) of those who were either unsure or not planning to receive the vaccine in June 2021 indicated concern of possible side effects as the main reason for their reluctance. Despite a spike in the number of infections, the figure increased significantly in the subsequent two months to 61.2 and 73.4 percent.

Low vaccination rate and the important disparities that have emerged in vaccination and vaccine hesitancy highlight the need for a robust and more inclusive vaccination campaign. Iraqis with higher levels of education, with formal public-sector jobs, men, and those in urban areas are more likely to have been vaccinated than those with lower levels of education, with informal private-sector jobs and self-employment, women, and in rural areas. Households' food consumption and financial security are other distinct features for being vaccinated. Iraqis from poorer households are significantly less likely to have been vaccinated than those from relatively wealthier households. In contrast, these trends reverse when it comes to vaccine hesitancy. The low vaccination among the elderly, and those with higher risk of exposure- poorer households and informal workers that are less likely to work from home and more likely to live in large households in cramped conditions- is of particular concern. Iraq should prioritize the elderly and other vulnerable groups and increase overall access to covid-19 vaccines. Public messaging should be tailored and targeted to different segments of the population.

موجز تنفيذي

رغم ان العراق مازال يشهد ارتفاعا في عدد حالات الإصابة بفيروس كورونا ، فإن نسبة السكان الذين تم تطعيمهم ضد الفيروس ما تزال منخفضة جدا. و وفقا لبيانات موقع «عالمنا في البيانات» ، و اعتبارًا من منتصف كانون الثاني (يناير) ٢٠٢٢ ، فإن ١٥ في المائة فقط من العراقيين جرى تطعيمهم بالكامل ، و ٧ في المائة آخرين تم تطعيمهم جزئيًا ضد كوفيد-١٩. وتعد هذه الأرقام من بين أدنى المعدلات في منطقة الشرق الأوسط وشمال إفريقيا (MENA) ، وهي أقل بكثير من معدلات التطعيم العالمية البالغة ١٥ و ١٠ في المائة من التطعيمات الكاملة والجزئية على التوالي.

وللحصول على صورة أوضح و أكثر تعمقًا لحالة التطعيم في العراق ، تقدم هذه المذكرة نتائج حول التفاوتات والتردد تجاه تلقي التطعيم (اللقاح) ضد كوفيد-١٩ من خلال الجولات الثلاث الأخيرة من المسح الهاتفي عالي التردد في العراق (IHFPS) الذي تم إجراؤه بين حزيران / يونيو و آب / أغسطس ٢٠٢٢. و ابتداءً من شهر آب / أغسطس ٢٠٢٢ ، تعاون البنك الدولي مع برنامج الأغذية العالمي ونفذ تسع (٩) جولات من المسح الهاتفي عالي التردد في العراق IHFPS كجزء من مسح برنامج الأغذية العالمي الشهري عن طريق تحليل نقاط الضعف المتنقلة ورسم الخرائط mVAM. وقد تم إجراء مقابلات مع أكثر من ٦٠٠ شخص بالغ من جميع أنحاء العراق في كل جولة باستخدام الهواتف المحمولة. اشتمل المسح على العديد من النماذج الاجتماعية والاقتصادية بالإضافة إلى نماذج الأمن الغذائي لبرنامج الأغذية العالمي لتقييم حالة الأمن الغذائي المتطورة خلال فترة الوباء. وقد تضمنت الجولات الثلاث الأخيرة من المسح أيضًا برنامجًا حول التلقيح ضد كوفيد-١٩ لرصد توزيع اللقاح وقبوله في البلد.

تشير نتائج المسح إلى وجود اتجاه منخفض ولكنه متزايد لأخذ اللقاح بين العراقيين البالغين ، ومع ذلك ، لا تزال مقاومة أخذ اللقاح عالية. و مع انتشار المتغير (المتحور) دلتا في البلاد ، تضاعفت حصة العراقيين الذين تبلغ أعمارهم ٨١ عامًا فما فوق مع الجرعة الأولى على الأقل من لقاح كوفيد-١٩ بين حزيران / يونيو و آب / أغسطس. بينما كان ثلث آخر من السكان يخططون لتلقي اللقاح ، كانت الغالبية (٩١,١٥ و ٦,٣٤ في المائة في حزيران / يونيو و آب / أغسطس على التوالي) إما مترددة في أخذ اللقاح أو لم تكن تخطط لتلقي اللقاح. و لا يبدو أن الافتقار إلى المعرفة بشأن التوافر يمثل مشكلة لأن جميع البالغين غير الملحقين تقريبًا كانوا على دراية ولديهم معرفة بمكان الحصول على اللقاح.

إن الخوف وانعدام الثقة تجاه لقاح كوفيد-١٩ من المخاطر التي تقوض فعالية حملة التطعيم في البلد. إن غالبية الذين يترددون في أخذ اللقاح لديهم شعور بالقلق بشأن آثاره الجانبية. و أشار أكثر من نصف (١٥ بالمائة) الذين كانوا غير متأكدين أو لا يخططون لتلقي اللقاح في حزيران / يونيو من عام ٢٠٢٢ إلى القلق والمخاوف من الآثار الجانبية المحتملة باعتباره السبب الرئيسي لترددهم. على الرغم من الارتفاع الكبير لعدد الإصابات ، فقد ارتفع الرقم بشكل ملحوظ في الشهرين التاليين إلى ٢,١٦ و ٤,٣٧ في المائة.

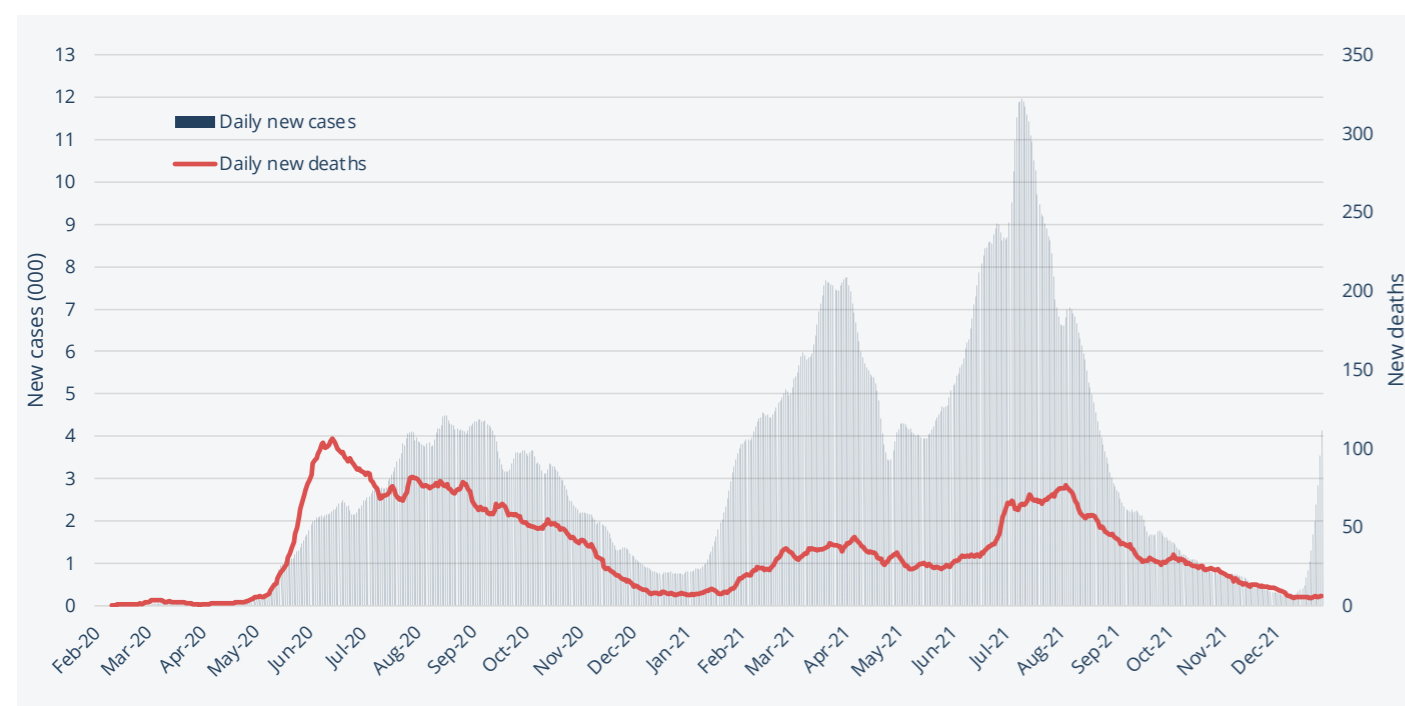
إن انخفاض معدلات التطعيم والتفاوتات المهمة التي ظهرت في التطعيم والتردد في أخذ اللقاح يسلب الضوء على الحاجة إلى حملة تطعيم قوية وأكثر شمولًا. إن العراقيين الحاصلين على مستويات تعليمية عالية ، والذين لديهم وظائف رسمية في القطاع العام ، والرجال ، وأولئك الذين يعيشون في المناطق الحضرية من المرجح ان يكونوا قد تلقوا التطعيم بنسبة أكثر من أولئك الذين لديهم مستويات تعليم أقل ، وأولئك الذين لديهم وظائف في القطاع الخاص غير الرسمي والعمل الحر ، والنساء ، و في المناطق الريفية. يعد استهلاك الطعام والأمن المالي للأسرة من السمات المميزة الأخرى للتلقيح. فالعراقيون الذين ينتمون إلى أسر فقيرة هم أقل احتمالًا بشكل ملحوظ لتلقي التطعيم من أولئك الذين ينتمون إلى أسر أكثر ثراءً نسبيًا. في المقابل ، تنعكس هذه الاتجاهات عندما يتعلق الأمر بالتردد في تلقي اللقاح. ومما يثير القلق بوجه خاص انخفاض مستوى التطعيم بين كبار السن ، و بين هؤلاء الذين لديهم مخاطر أعلى للتعرض - مثل الأسر الفقيرة والعمال غير الرسميين (غير النظاميين) الذين هم أقل احتمالًا للعمل من المنزل والأكثر احتمالًا للعيش في أسر كبيرة في ظروف ضيقة . ينبغي على العراق إعطاء الأولوية لكبار السن والفئات الضعيفة الأخرى (مثل الفقراء والعمال غير الرسميين) وزيادة فرص الحصول بشكل عام على لقاحات كوفيد-١٩. ينبغي أن تكون الرسائل العامة مصممة وموجهة إلى شرائح مختلفة من السكان.

Background

Background

Iraq, like many countries around the world, has experienced a surge in the number of Covid-19 cases with the spread of Omicron variant. After a peak of 12,000 daily new cases during the height of the third surge caused by the Delta variant in the summer of 2021, the numbers receded gradually and dropped below 300 by the end of 2021 (Figure 1). However, with the spread of the highly contagious Omicron variant, the cases in Iraq increased drastically. The country reported more than 4,000 new cases on January 19, 2022, and the trend is rising. Number of daily deaths attributed to the virus followed a similar trend. After a sharp rise during the first wave in July 2020, the number of new deaths dropped and remained below 100 throughout. While it increased during another surge in the summer of 2021, the daily mortality remained below 100 and gradually dropped to less than 10 per day by the end of 2021. Yet, the spread of the new variant into the new year elevated daily mortality figures once again.

Figure 1: Daily new cases and deaths attributed to Covid-19 (seven day rolling average).



Source: Our World in Data <https://ourworldindata.org/covid-vaccinations>

Despite employing swift containments measures, Iraq remains among the most Covid-19 impacted countries in the Middle East and North Africa (MENA) region in terms of cumulative cases and deaths. After Iran, Iraq has registered the highest number of Coronavirus cases and deaths in the region. As of January 19, 2022, Iraq had registered 2.1 million cases and 24,267 deaths attributed to the virus. These figures, however, are lower than in Bahrain, Lebanon, Jordan, Palestine, and Iran when accounting for the size of country's population (Figure 2). Iraq's 51,761 cases and 598 deaths per million people are also comparable to the global rates of 43,062 and 707 respectively.¹ Nonetheless, Iraq has been swift to implement various containment measures throughout the pandemic, which may have prevented the further spread and deaths from the virus. Both the federal and the Kurdistan regional governments enforced curfews, lockdowns, school closures and other measures during various waves of the virus. Based on the stringency index compiled by Our World in Data, Iraq either topped the chart or remained near the top among the MENA countries throughout the pandemic (Figure 3).

¹ Given limited testing, these figures, however, may be lower than the true number of infections; 416 tests per thousand people is among the lowest in the region and below the global average (Ritchie, et al., 2020).

Figure 2: Cumulative cases and deaths per 1 million population as of January 19, 2022.

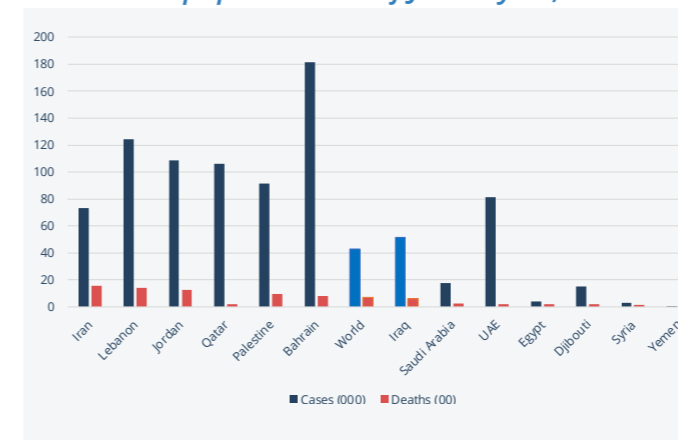
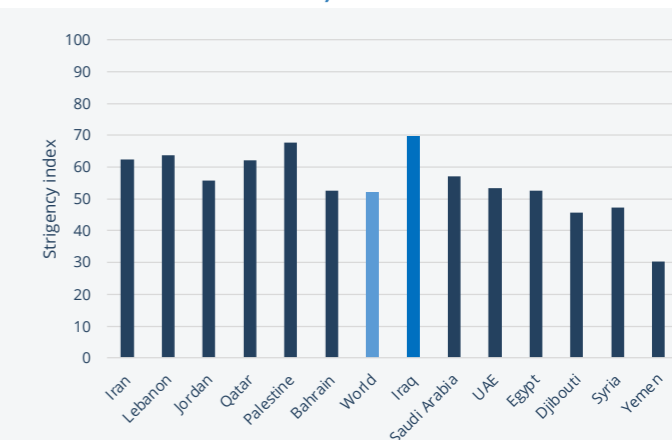


Figure 3: Average stringency index as of January 19, 2022.



Source: Our World in Data <https://ourworldindata.org/covid-vaccinations>

Iraq has made only modest progress in inoculating its population against the virus and has a vaccination rate that is well below the global average and one of the lowest in the region. Iraq signed up to the COVAX facility² in the last quarter of 2020 and agreed to pay for 16 million doses. However, it was unable to procure any vaccines until March 2021, when the first 50,000 doses arrived in the country from Sinopharm, a Chinese state-owned company. This was followed by 336,000 doses of the AstraZeneca vaccine through the COVAX facility. The country rolled out its vaccination program prioritizing its elderly population and health workers. As seen in Figure 4, vaccination remained very low until June 2021 with less than 10,000 doses administered per day. Even during the most severe period of the pandemic in July and August, daily inoculation remained below 50,000 doses. After a significant spike for short few days in early September when the country administered almost half a million doses daily, low inoculation rates continue to persist till now with only between 50,000 to 100,000 doses administered daily. Not surprisingly, the share of population vaccinated against the virus is low in Iraq (Figure 5). As of January 19, 2022, only 21.8 percent of Iraqis had received any dose of vaccines; while 14.9 percent were fully vaccinated, 6.9 percent were only partially vaccinated.³ This is significantly lower than the global vaccination rate of 60.2 percent - 50.7 fully vaccinated and an additional 9.5 partially vaccinated. Albeit most of MENA countries lag behind the global rate and significant disparity within the region, only Syria, Djibouti and Yemen in the region fare worse than Iraq in terms of share of population vaccinated against the virus (Figure 5).

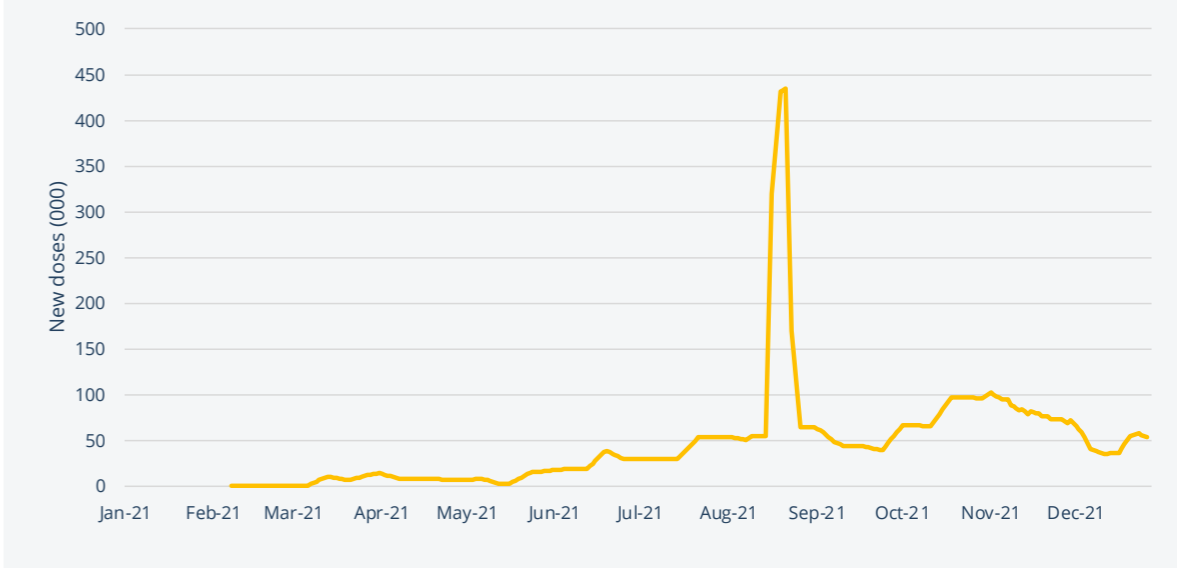
In addition to the economic and logistical challenges, wide-spread public fear, and mistrust towards the vaccine risks to undermine the efficacy of the country's vaccination campaign. As has been the case in other countries, vaccine hesitancy, and disinformation regarding the effects of vaccination remains a hinderance in Iraq. Evidence suggests a clear lack of enthusiasm among some Iraqis even before the vaccination program was rolled out. An online survey conducted in February 2021, also highlighted vaccine hesitancy. Out of a total of 9,431 online respondents, 16 percent indicated that they would not accept COVID-19 vaccines and another 45 percent said they were unsure about getting the vaccines when they become available in the country. Hesitancy against the vaccine continued once the vaccine became available. Although not a nationally representative sample, a survey conducted by the CARE Iraq in the governorates of Ninewa and Duhok in July 2021 showed that 68 percent of the people interviewed were not willing to receive the COVID-19 vaccines.

² COVAX is a global alliance co-led by the Coalition for Epidemic Preparedness Innovations (CEPI), Gavi - The Vaccine Alliance, and the World Health Organization (WHO), with the UNICEF as a key delivery partner. COVAX seeks to provide equitable distribution of vaccines primarily to lower-income countries. Since the rollout began in February 2021, COVAX has delivered the Covid-19 vaccines to 144 primarily low- and middle-income countries.

³ The vaccination rate as reported by the Our World in Data and the IHFPS differ due to various undelaying factors. First, while the Our World in Data reports the rate for the entire population, the respondents for the IHFPS are Iraqis 18 years or above, and, hence, it reports vaccination rate among adult Iraqis only. Second, the biases related to data sources are different. The survey results are estimates and concerns such as the lack of national representation, participation, and response biases, etc. that are related to phone surveys could be of factors. The figures from the Our World in Data, on the other hand, are calculated using the COVID-19 Data Repository by the Johns Hopkins University and their accuracy depends on how well the repository compiles the vaccination information.



Figure 4: Daily new Covid-19 vaccine doses administered (seven day rolling average).

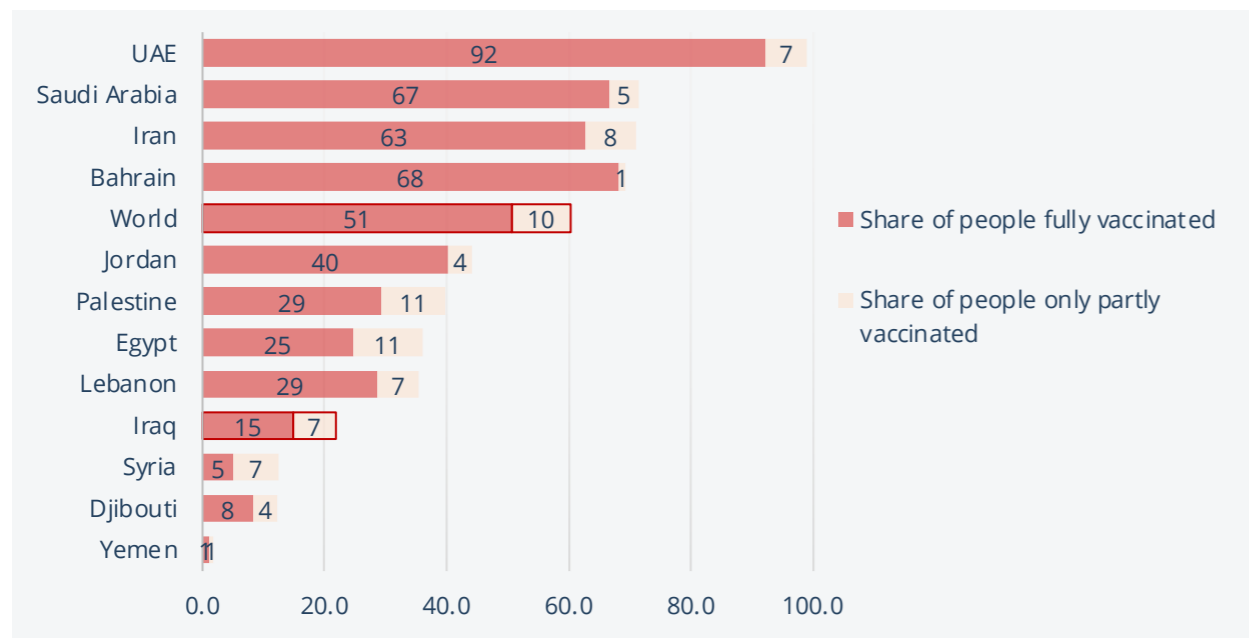


Source: Our World in Data <https://ourworldindata.org/covid-vaccinations>

For a more in-depth understanding of the state of vaccination, this note presents findings on Covid-19 vaccination disparities and hesitancy in Iraq from the last three rounds of the Iraq High Frequency Phone Survey (IHFPS) conducted between June and August 2021. The World Bank collaborated with the World Food Programme (WFP) and implemented nine (9) rounds of the IHFPS as part of the WFP’s monthly mVAM survey. To monitor the evolving situation and provide policy relevant recommendations, the survey included several socioeconomic modules in addition to the WFP’s food security module. For each round, more than 1,600 adult respondents from across Iraq (nationally representative) were interviewed using mobile phones. However, we note that although the phone survey was designed to be a panel, individuals who cannot be tracked are replaced to meet the target sample size in each round. Since the survey is part of the WFP’s long ongoing monthly mVAM survey, the attrition is substantial. For the last three rounds of the 1,627 individuals interviewed in June 2021, 1,404 could be tracked through July to August 2021. Thus, an attrition rate of 24.3 percent.⁴ While the first 6 rounds of the survey were implemented between August 2020 and January 2021, the last three rounds were conducted between June and August 2021. These last three rounds also included a module on Covid-19 vaccination to monitor vaccine distribution and acceptance in Iraq.

⁴ The data collection methodology consists of a countrywide survey covering the 18 governorates in Iraq. The sample size is disaggregated by 18 governorates and the survey firm applied a random sampling approach to reach participants from different governorates to reach the given geographical quotas. The governorate population and details of quota are provided in Annex I. All major Mobile Network Operators (MNOs) active in the country were included within the sampling frame to ensure a representative sample. The sample size is designed to detect changes in the prevalence of food insecurity (mainly people with inadequate food consumption) at governorate level as reported in the 2016 Comprehensive Food Security and Vulnerability Analysis (CFSVA) survey in Iraq. Average number of attempts per phone number was below 1.5 calls for all three rounds. Krah, Phadera, & Wai-Poi (2021) provide details on sampling and survey design.

Figure 5: Share of population vaccinated against Covid-19 as of January 19, 2022.



Source: Our World in Data <https://ourworldindata.org/covid-vaccinations>

Table 1 reports summary statistics of the respondents and their household characteristics for each of the three last rounds of the survey. As in the earlier rounds, most of the survey respondents (about 65 percent, unweighted) in the June to August 2021 rounds were males. About 60 percent had at least a secondary education and most of the respondents (over 60 percent) were their households' main breadwinners. The average respondent was about 36 years old and lived in a household with about 6 members including herself. Across all three rounds, above 54 percent reported living in their own dwelling.⁵

Table 1: Respondents and household characteristics (by survey round).

Characteristic	June	July	August
Percent of respondents who are male	64.3	64.6	65.3
Percent of respondents with secondary or higher level of education	60.0	58.8	59.0
Percent of respondents who are breadwinners	61.6	64.4	62.5
Average age of respondents	35.8	35.9	35.9
Average household size	6.4	6.5	6.5
Percent of respondents living in a dwelling that their household owned	54.2	54.1	54.5
Sample size	1627	1635	1628

Source: Authors' calculation using IHFPS 2021.

The results in the note are presented in two parts. The first part provides overall trends of vaccination and vaccine hesitancy among the adult population, awareness of vaccine availability and knowledge of where to get vaccines, and concerns/reasons why some may be hesitant to receive one. The second part of the results focuses on the latest data (August 2021 round) to delve deeper into vaccination inequities and heterogeneity in vaccine hesitancy.

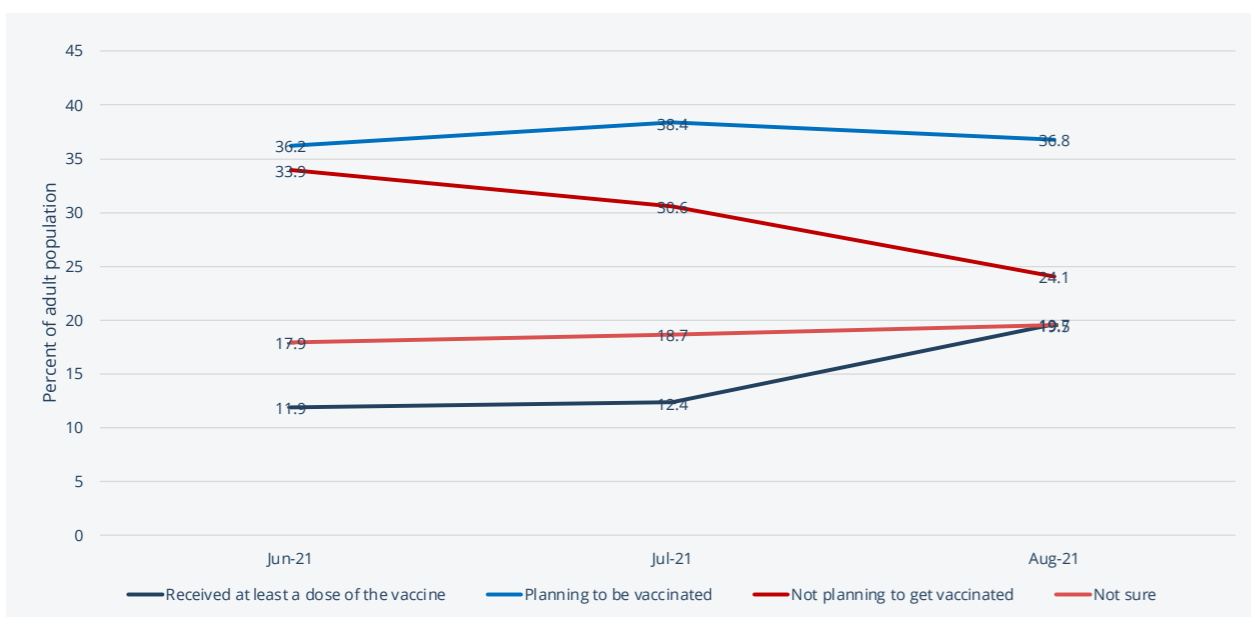
⁵ To ensure representativeness at national level, we construct cross-sectional survey weights for each round. Although, cost-effective, flexible and can be implemented rapidly, lack of national representativeness of phone surveys is of concern. Therefore, using the nationally representative Multi Indicator Cluster Survey (MICS) 2018 as a reference survey, we reweight the initial sampling weights through propensity score matching (PSM) and post-stratification procedures. Three set of weights - household, population, and adult - are created to make the phone survey resemble the distribution of the specific population in the MICS survey. Weight calculation and reweighting procedure are detailed in Annex II. All the results presented in the report are calculated using adult weights unless specified otherwise.

Results I: Vaccination and Vaccine Hesitancy

Results I: Vaccination and Vaccine Hesitancy

The survey suggests a low but an increasing trend of Covid-19 vaccination among adult Iraqis (i.e., those 18 years old and above) between June and August 2021. As of June 2021, only 11.9 percent of the survey respondents had received at least a dose of COVID-19 vaccine. This figure increased slightly to 12.4 percent in July (Figure 6). With the increased availability of vaccines in the country, the figure increased by 7.3 percentage points to 19.7 percent by the end of August 2021.

Figure 6: vaccination and vaccine hesitancy among Iraqi adults aged 18 or over.



Source: Authors' calculation using IHFPS 2020/21. The figures are weighted using adult survey weights.

While it decreased slightly, vaccine reluctance remained high even during the period when daily infections were highest in the country. The share of adults planning to receive the vaccine, remained constant during the three months (Figure 6). The figure increased slightly from 36.2 to 38.4 percent from June to July, but fell back to 36.8 percent in August, which, to a degree, may have been driven by some of those who were planning to receive vaccine in the earlier rounds already getting vaccinated. More worrying, on the other hand, is high share of adults who still indicated either being unsure or not planning to be vaccinated against the virus. One third (33.9 percent) of the adults in June reported that they did not plan to receive the vaccine. When the Covid-19 cases started to spike in July and August, the figure dropped significantly by 6.5 percentage points from 30.6 and 24.1 respectively. Those still unsure of getting vaccinated against the virus increased from 17.9 percent in June to 19.5 percent in August. Almost half of the adults in Iraq (51.9 percent in June and 43.6 percent in August) still being unsure or not planning to be vaccinated is concerning given the importance of the vaccine's efficacy against severe symptoms and hospitalization. This may undermine the efforts to reduce the spread of the virus and returning of social and economic normalcy in the country.⁶

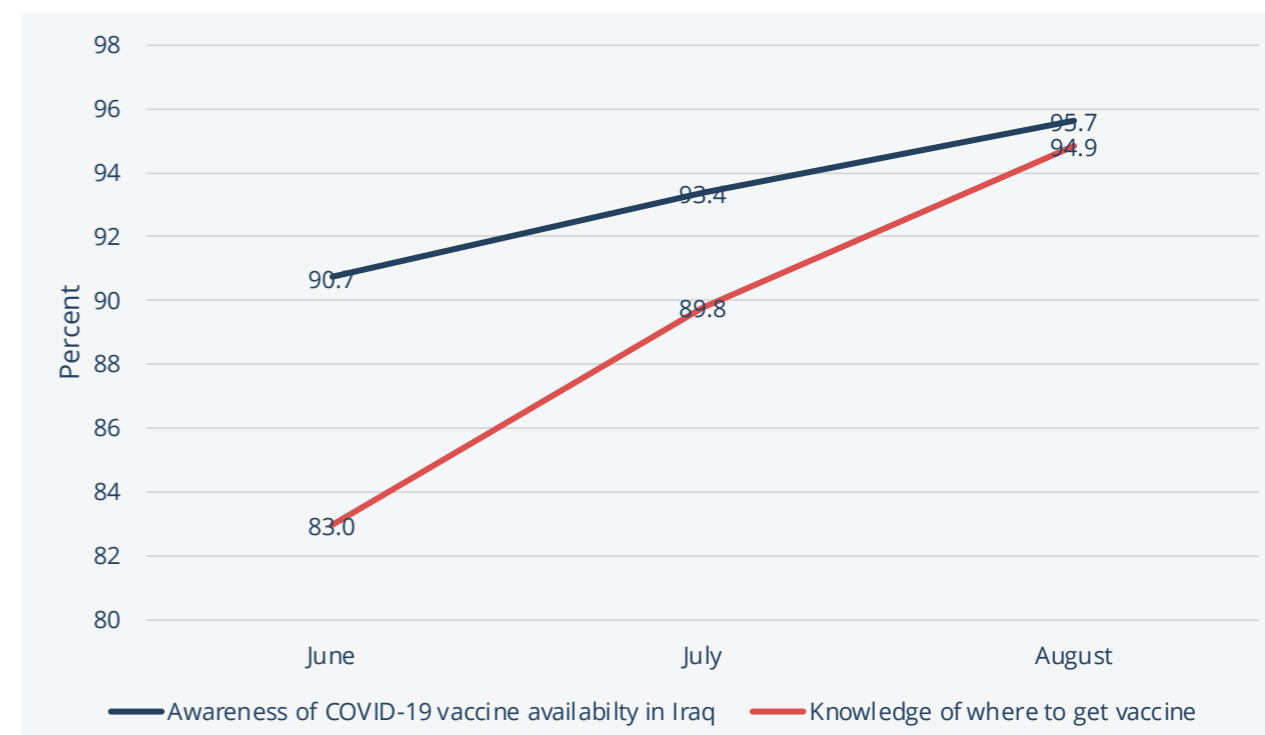
⁶ Results from the January 2021 round of the Iraq High Frequency Phone Survey (IHFPS) showed that over 32 percent of Iraqi adults were uncertain about getting the shots - 16.3 percent of the respondents expressed "no opinion" to the statement "I would accept a COVID-19 vaccine which is proven to be safe and effective", while 15.9 percent disagreed either strongly or to some degree with the statement (Krah K., Phadera, Tanner, & Muger, 2021).



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Lack of knowledge regarding the availability of vaccine does not appear to be a problem as most unvaccinated adults are aware and have knowledge about where to get the vaccine. The survey showed that most of the unvaccinated adults are aware of the country's vaccination program. By June 2021, 90.7 percent of adult Iraqis who were yet to receive a single dose of the vaccine were aware of the availability of vaccine in the country. This figure increased to 93.4 and 95.7 percent in July and August respectively (Figure 7). Moreover, most of the unvaccinated adults are also aware of where to get the vaccine. While 83.0 and 89.8 percent of the unvaccinated adults in June and July indicated that they knew where to get the vaccine, the share rose to 95 percent by end of August.

Figure 7: Awareness and knowledge regarding Covid-19 vaccine availability among unvaccinated



Source: Authors' calculation using IHFPS 2020/21. The figures are weighted using adult survey weights.

Furthermore, awareness as regards to vaccine accessibility remain similar between the group hesitant to be vaccinated and the one planning to receive the vaccine. Among both hesitant groups (unsure and not intended to be vaccinated) in June to August 2021, above 87 percent were aware of vaccine availability in the country. This trend was very similar for the group that was planning to receive the vaccine (Figure 8). Share of people with knowledge of where to get vaccine was similarly high and increased over time for all the three groups (Figure 9). In fact, the share was consistently greater among the undecided group, even more so than among those who were planning to receive the vaccine. These findings suggest that while awareness of vaccine availability in the country is important, it might not be enough in getting people to be vaccinated.

Figure 8: Awareness and knowledge of vaccine in Iraq by hesitancy category (among unvaccinated adult Iraqis)

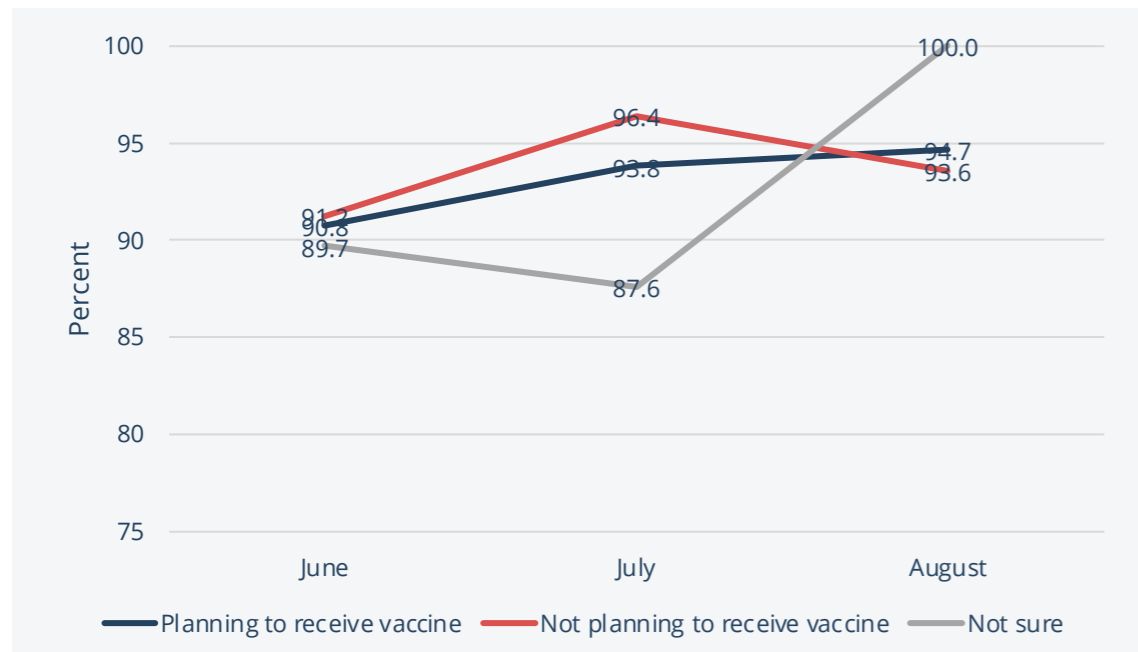
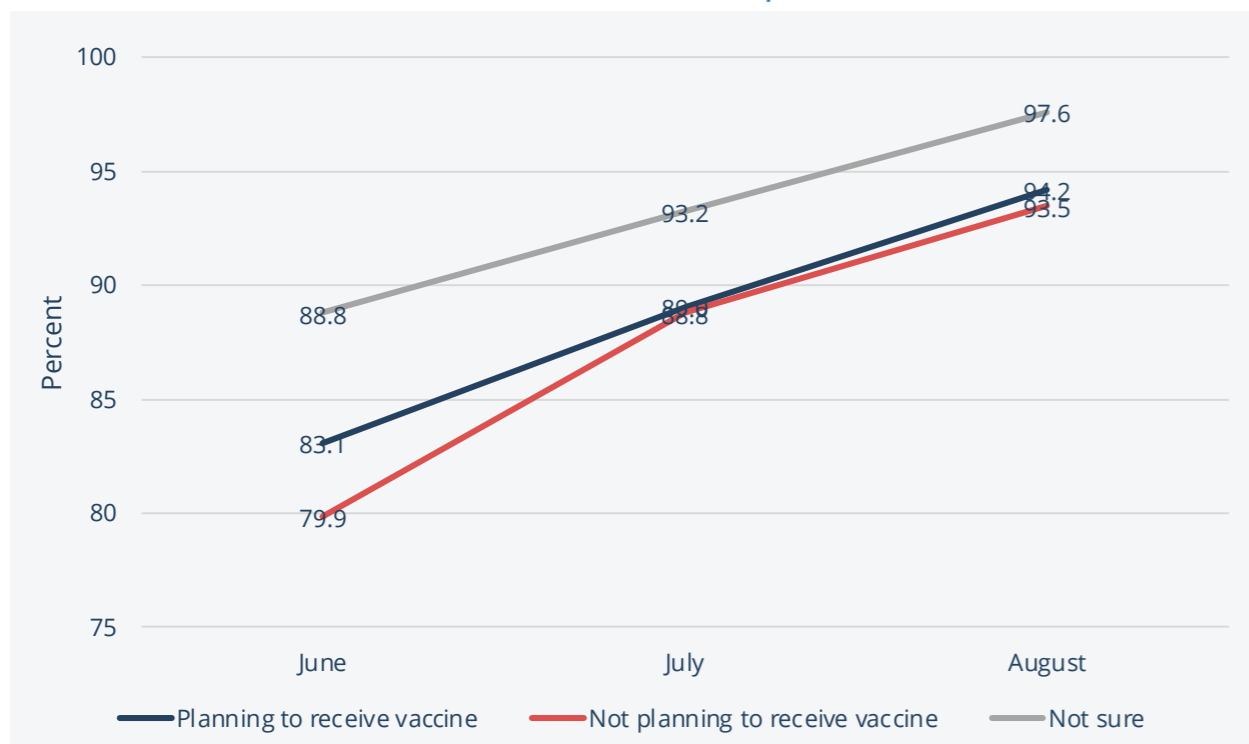


Figure 9: Knowledge of where to get vaccine by vaccine hesitancy category (among unvaccinated adult Iraqis)



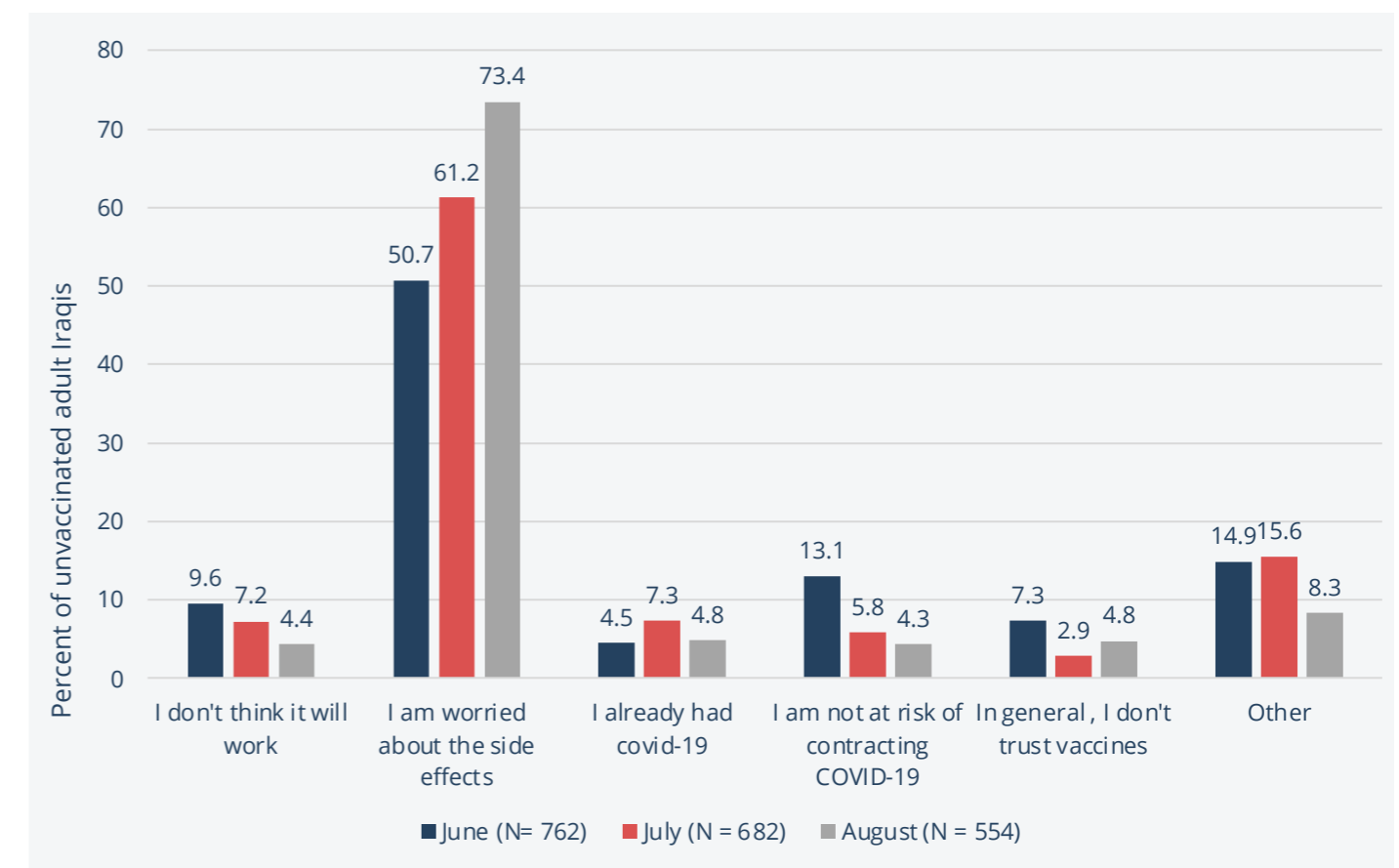
Source: Authors' calculation using IHFPS 2020/21. The figures are weighted using adult survey weights.

Concerns regarding possible side effects of the vaccine is the single most cited reason why a significant number of adults in Iraq remain hesitant to the COVID-19 vaccine. A majority of those who are reluctant to the vaccine are worried about its side effects. More than half (51 percent) of those who were either unsure or not planning to receive vaccine in June 2021 indicated concern of possible side effects as the main reason for their reluctance. Despite spikes in the number of infections driven by the Delta variant, the figure increased significantly in the subsequent two months to 61.2 and 73.4 percent (Figure 10). This trend has a potential to impede the progress of vaccination.

Although significantly less, other more cited reasons such as believing in having lower risks of contracting the virus and the vaccine not being effective decreased with rising infections.

At the beginning of the third wave driven by the Delta variant in June, about 10 percent cited "I don't think the vaccine will work" and another 13 percent cited "I am not at risk of contracting Covid-19" as reasons for not wanting to take vaccine (Figure 10). By the end of August when daily infections were at the peak, only 4.4 and 4.3 cited such reasons.

Figure 10: Reasons why unvaccinated adult Iraqis are not sure or not planning to get vaccinated



Source: Authors' calculation using IHFPS 2020/21. The figures are weighted using adult survey weights.

Results II: Disparities in Vaccination and Vaccine Hesitancy

Results 2: Disparities in vaccination and vaccine hesitancy

Vaccination and vaccine reluctance differ by level of education. Based on the latest available phone survey data (August 2021), individuals with higher education are significantly more likely to receive the Covid-19 vaccine, whereas vaccine hesitancy is more prevalent among those with lower levels of education. As of August 2021, only 4.8 percent of adult Iraqis with no formal education had received any vaccine compared to 29.1 and 45.6 percent of those with secondary and tertiary levels of education (Figure 11). In contrast, more than two third (68.9 percent) of adults with no formal education were reluctant/hesitant (either not sure or were not planning) to receive the vaccine while only 25.7 of people with tertiary education indicated so (Figure 12). Efforts need to be made to reach the less educated people in the country with information about the safety of Covid-19 vaccines.

Figure 11: Vaccination by respondents' education status

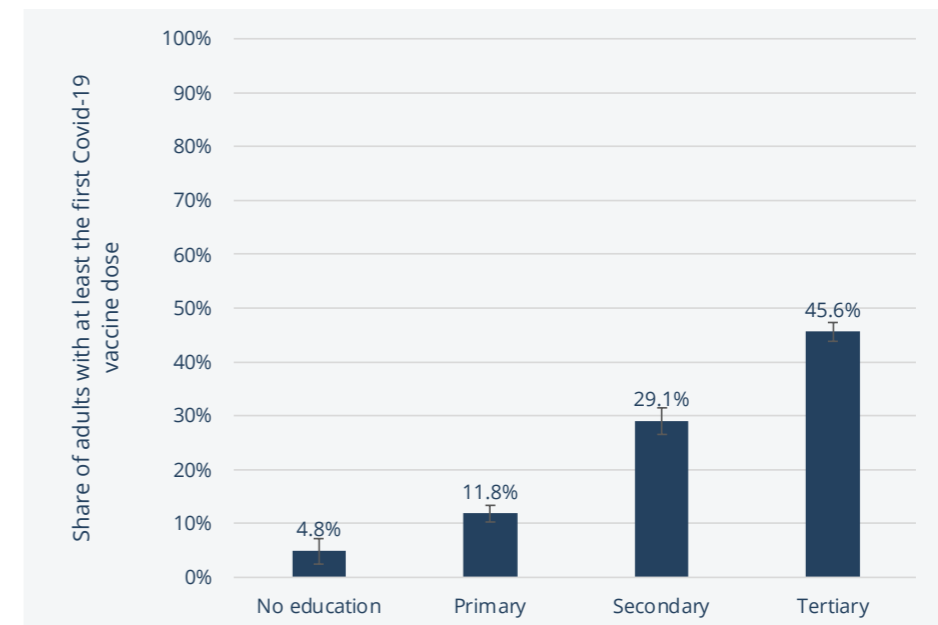
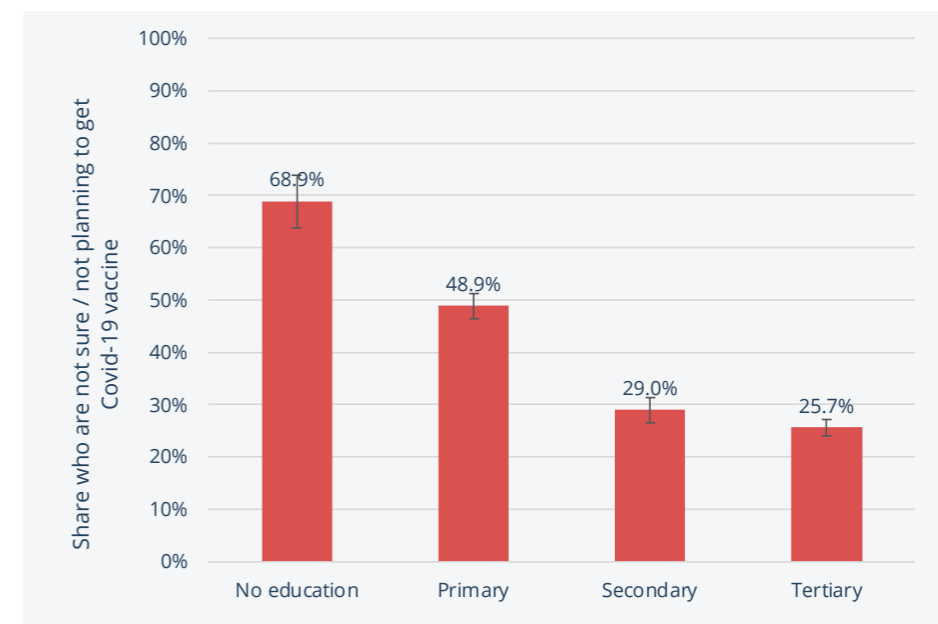


Figure 12: Vaccine hesitancy by respondents' education status



Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights..

Iraqis employed in the formal public sector are significantly more likely to have received the Covid-19 vaccine and are also less hesitant to receiving it compared to those in private sector, self-employed and those without jobs. By August 2021, more than 42 percent of adults working in the public sector had received at least the first dose of Covid-19 vaccine, while only 17.8 percent of those employed in the private sector had received any doses of the vaccine (Figure 13). The rate was even lower for those self-employed (6.8 percent) and unemployed (13.9 percent). Prevalence of the vaccine hesitancy, on the other hand, was highest among self-employed (Figure 14). Unemployed adults and the private sector workers were also significantly more likely to be resistant against the vaccine take-up.

Figure 13: Vaccination by respondents' employment status

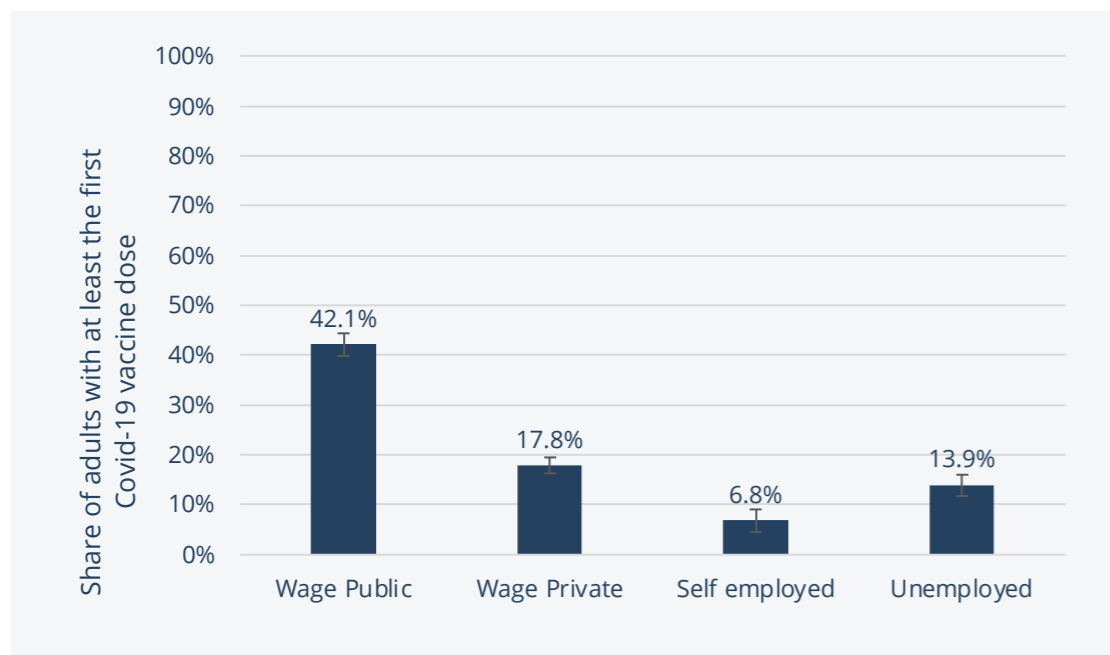
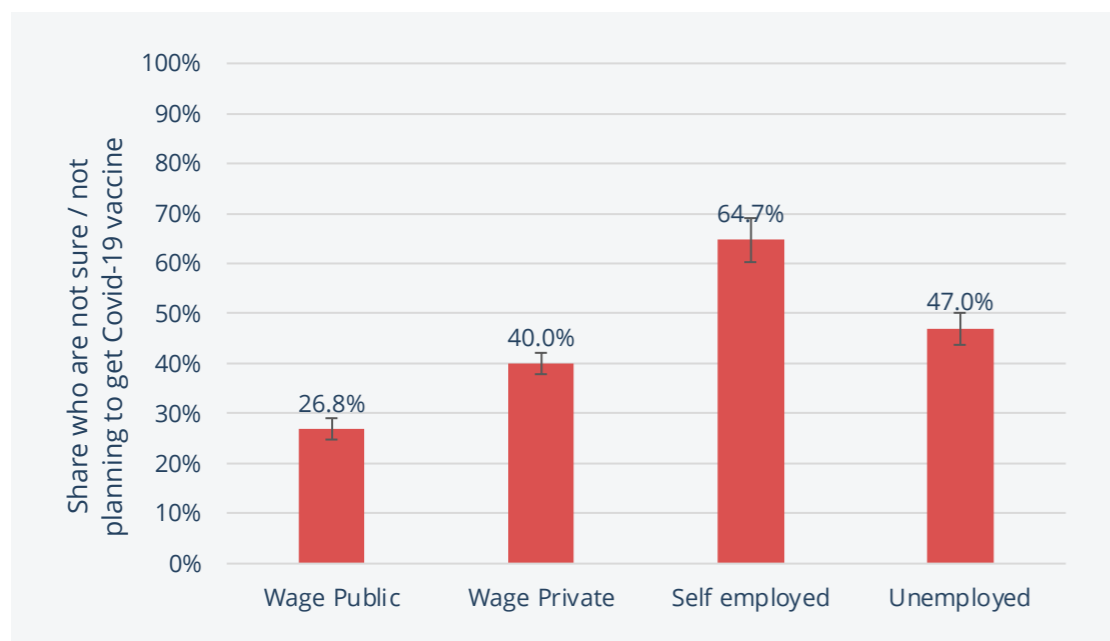


Figure 14: Vaccine hesitancy by respondents' employment status



Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights..



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Older Iraqis are slightly less likely to be vaccinated and more resistant to the vaccine. Aside from people between 40 to 49 years, other age groups had vaccination rates that is relatively close to that of the overall rate of 19.7 percent in August (Figure 15). However, it is notable that only 17.7 percent of the elderly (60 and more) population was vaccinated, which was lower than among some of the younger age groups with less covid risks. Furthermore, compared to the young adults between 18 to 29, older Iraqis are more hesitant to receive the COVID-19 vaccine. Among those in age group 18-29, 38 percent indicated that they were not sure or not planning to get the vaccine but more than half of those in the age category 40-49 expressed such view in August (Figure 16). Vaccine resistance was high (45.5 percent) even among elderly, 60 years and above. While the aged and those with pre-existing conditions are known to have higher risks of developing severe symptoms, younger Iraqis tend to be more receptive to the vaccine.

Vaccination rates are relatively higher for men, in the Central region, and in urban areas but the prevalence of vaccine hesitancy remain consistent across gender, geographical regions and environment. The results suggest that, as of August 2021, while 21.0 percent of adult male Iraqis had received at least a dose of the vaccine, only 18.3 percent of the adult female population had done so (Figure 17). A similar percent of male and female adults (44.0 vs 43.2 percent) was either not sure or were not planning to receive the vaccine as of August 2021 (Figure 18). Similar findings emerge among rural and urban populations. While 21.4 percent of urban dwellers had received at least one dose of COVID-19 vaccine as of August 2021, only 15.3 percent of rural dwellers had done so during this period. In terms of vaccine hesitancy, 43.2 percent, and 44.6 percent of adult Iraqis in urban and rural areas indicated they're not sure / not planning to receive the vaccine.

Figure 15: Vaccination by respondents' age group

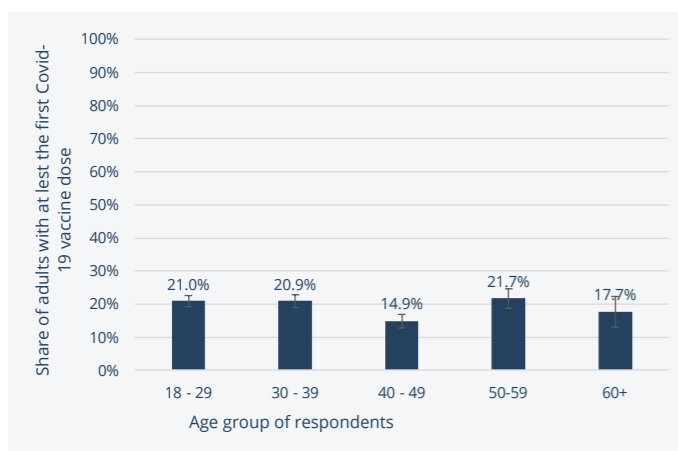
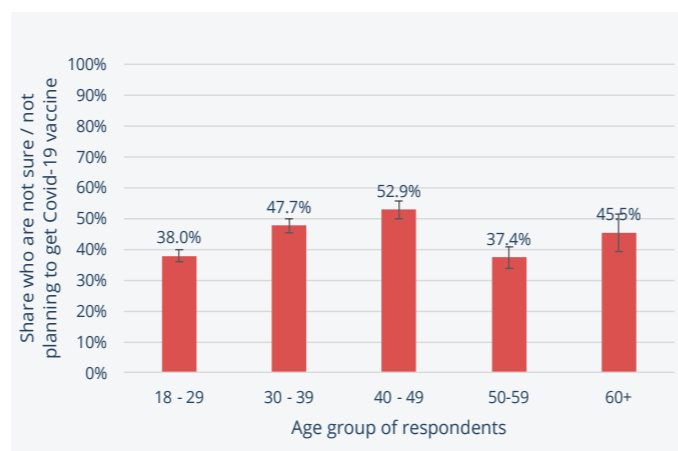


Figure 16: Vaccine hesitancy by respondents' age group



Both vaccination and vaccine hesitancy are strongly correlated with the respondents' household food consumption and financial security. Individuals from households that consume adequate diets are more likely to be vaccinated and so are those whose household have enough resources to sustain current expenditures. Based on the WFP's food consumption score (FCS), which measures the dietary diversity and frequency of food consumed, we define households with "poor" and "borderline" food consumption, that is FCS less than 35, as those with inadequate diet. While 19.8 percent of respondents from households that consumed adequate diets indicated they had received at least a dose of the vaccine as of August 2021, 16.9 percent of those from households that consumed inadequate diets indicated so (Figure 19). The survey also asked if the households had enough resources to sustain usual expenditures for the current month. Adult vaccination rate was even more contrasting between households with and without the resources to meet the regular expenditures, 26.4 and 9.0 percent respectively (Figure 19). Prevalence of vaccine resistance, on the other hand, are reversed. Adults from households with inadequate diets and economically less secured (not having sufficient resources to meet current expenditures), were significantly more likely to be unsure or not planning to receive the vaccine (Figure 20).

Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights..

Figure 17: Vaccination by gender, region, and environment type

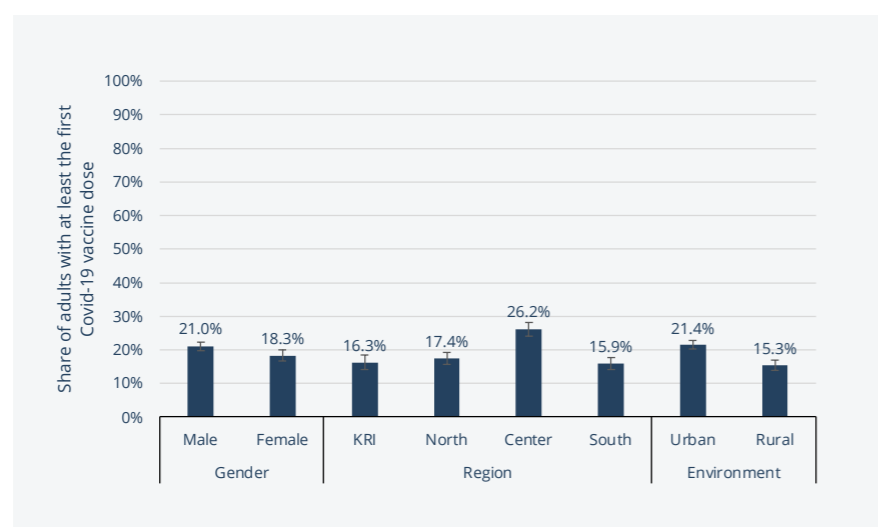


Figure 19: Vaccination and respondent's household food consumption and expenditure

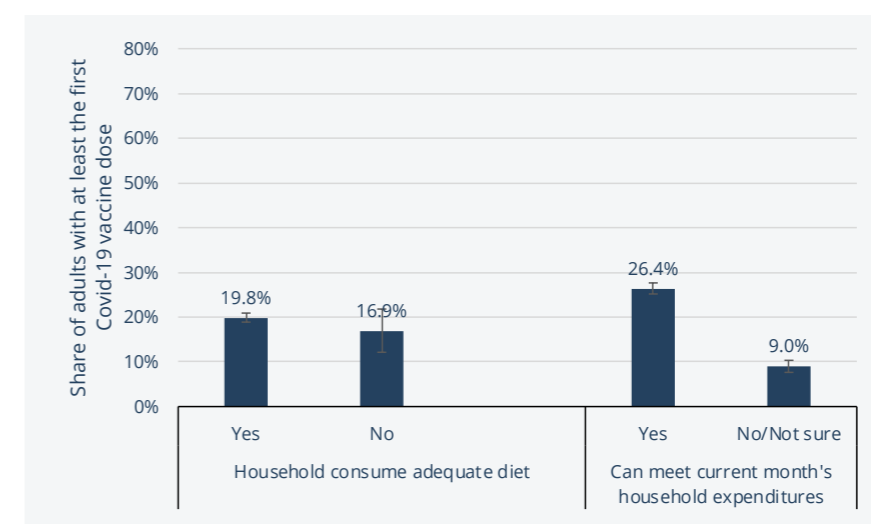


Figure 18: Vaccine hesitancy by gender, region, environment type

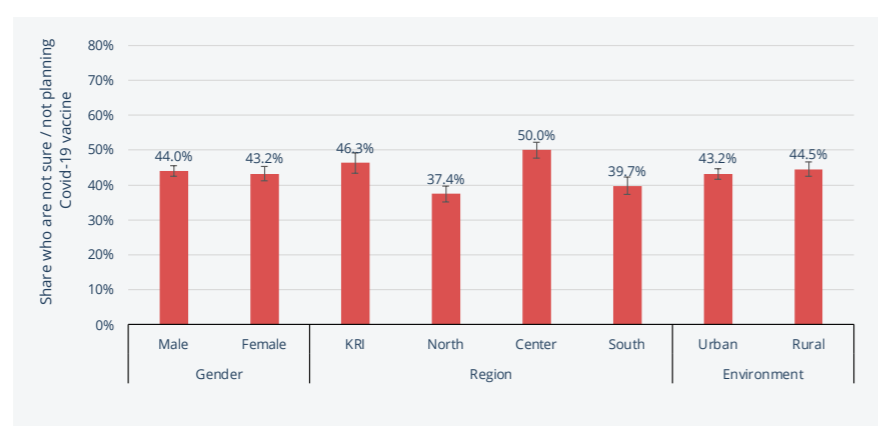
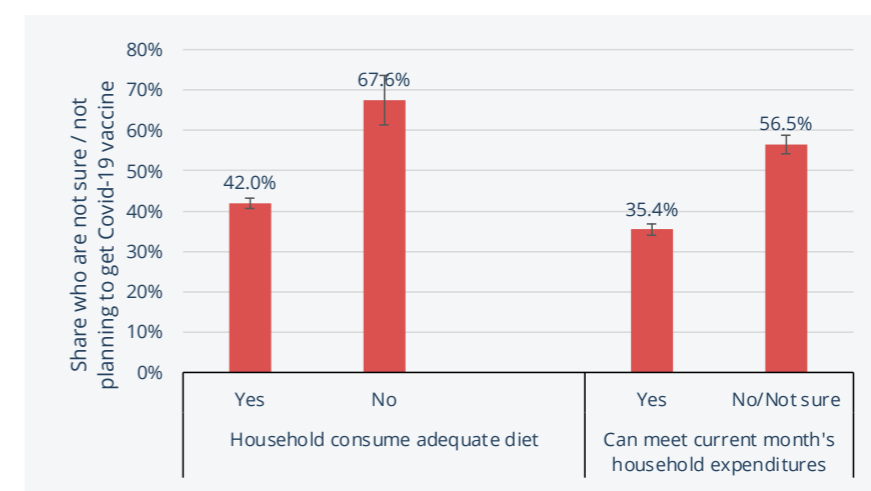


Figure 20: Vaccine hesitancy and respondent's household food consumption and expenditure



Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights..

Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights..



Household's ownership of some key assets is also highly correlated with vaccination status and vaccine acceptance. Household owning a dwelling (23.2 percent), computer (29.2 percent) and having internet access at home (22.0 percent) are associated with greater adult vaccination rate (Figure 21). Adults from households that own these key assets are also less resistant to the vaccine compared to those without the assets, but the rate of hesitancy remains high across the board. In August 2021, about 40 percent of adults from the households with these assets were not sure or not planning to receive the vaccine (Figure 22). In comparison, 67.6 percent 48.8 and 52.5 percent of the adults from the households that did not own dwelling, computer and did not have internet at home were resistant to the vaccine.

Figure 21: Vaccination and asset ownership

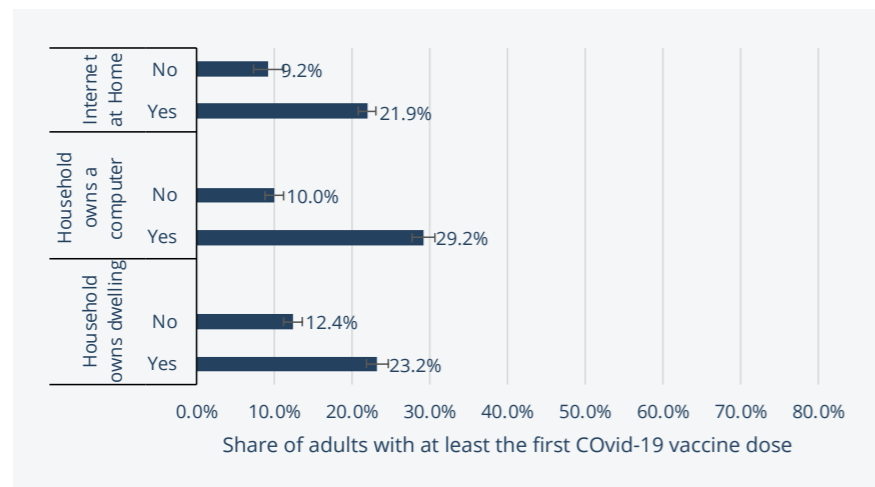
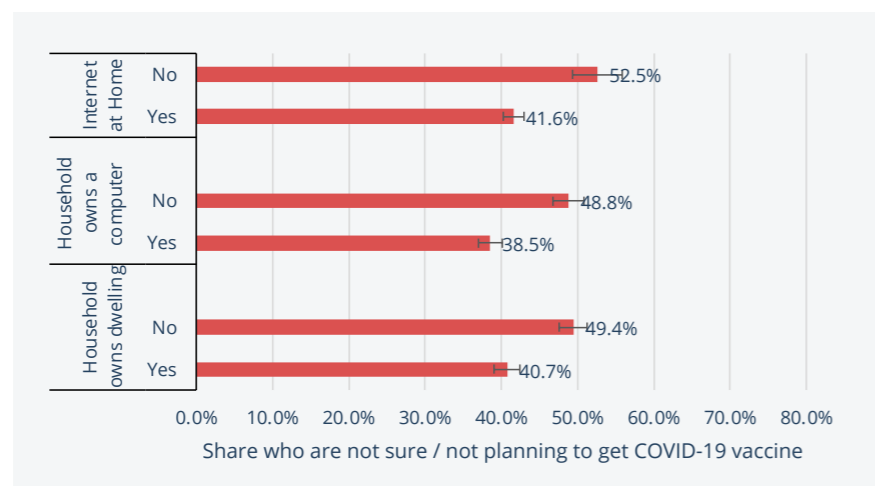


Figure 22: Vaccine hesitancy and asset ownership



Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights.

Figure 23: Vaccination by respondent's household wealth index

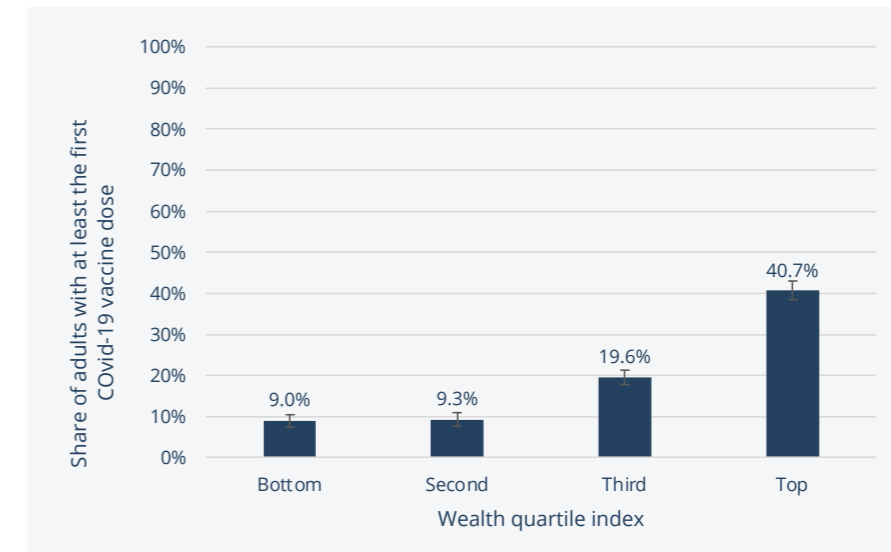
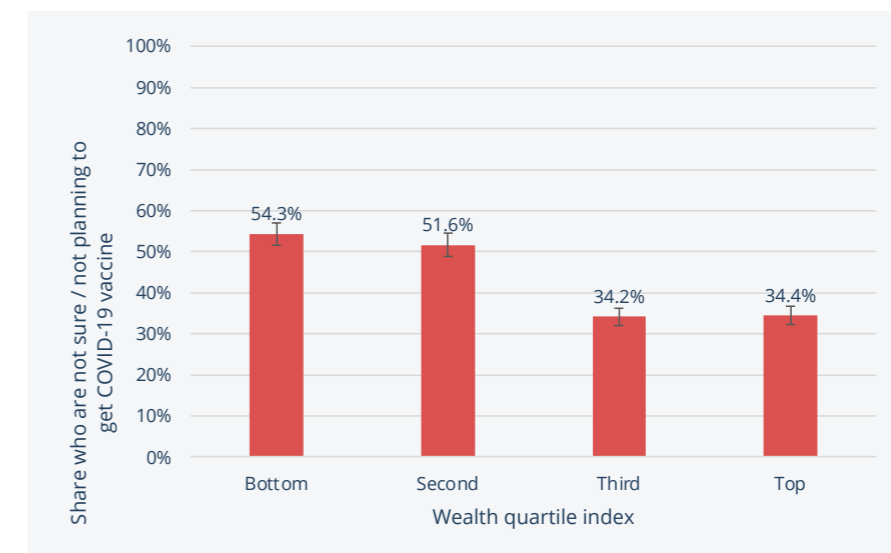


Figure 24: Vaccine hesitancy by respondent's household wealth index



Source: Authors' calculation using IHFPS August 2021 round. The figures are weighted using adult survey weights.

Overall, adult vaccination and vaccine acceptance is closely associated with household economic status. Based on the food consumption, expenditure, and asset ownership variables discussed above, we create household wealth index using the principal component analysis (PCA). Consistent with the earlier findings, adults from relatively wealthier households are more likely to have been vaccinated but skepticism against the vaccine is more prevalent among the poorer households. Below 10 percent of the adults from the bottom two wealth quartiles were vaccinated as of August 2021 compared to 19.6 and 40.7 from the top two quartiles (Figure 23). While 34.2 and 34.4 percent of adults from the third and fourth wealth quartiles were either undecided or had already decided on not getting the vaccine, more than a half of the adults from the bottom and second quartiles (54.2 vs 51.8 percent) indicated their reservation against the vaccine (Figure 24). The low overall vaccination rate in Iraq is of concern, however, emerging disparities in vaccination and vaccine rejections are equally concerning. These diverging trends appear to be born out of the discrepancies in both the access to vaccine and the critical awareness regarding Covid-19 diseases and the vaccine.

Discussion and Conclusions

Discussion and Conclusions

While vaccines remain the most effective methods to control the Covid-19 pandemic and critical for gradual re-opening of the country, the share of Iraqis receiving Covid-19 vaccine remains very low. Early on when the Covid-19 vaccines became available, countries across the world grappled with procuring enough vaccine for their populations. Poorer countries struggled to afford and faced logistical challenges with procurement and remained behind in the queue. But with the increased availability of vaccine, especially, after the wealthier nations' inoculation programs, vaccination rates have increased even in the poorer countries. Vaccination in Iraq, on the other hand, are still sluggish and the vaccination rate lags well behind the global rate. Besides a bump for few days in September 2021 (after the country received over 500,000 COVID-19 vaccine doses from the US government), the daily doses of vaccine administered remained low throughout (Figure 4). According to data from Our World in Data, only 15 percent of the Iraqi population is fully vaccinated (Figure 5). This number is significantly lower than the global rate of 51 percent and among the lowest in the region; only lowered by Syria, Yemen, and Djibouti (Figure 5).

Fear and misinformation regarding the Covid-19 vaccine remain widespread. Even during the height of the Delta wave in August 2021, 45 percent of adult Iraqis were either undecided or had decided against receiving the COVID-19 vaccine. More than 70 percent cited fear of the vaccine's side effects as the main reasons for resisting to be inoculated against the virus. While there is no other nationally representative survey to compare against, these findings are in line with other studies that have documented the high prevalence of public fear and hesitancy of the vaccine in Iraqi Kurdistan (Tahir, et al., 2021), in Ninewa and Duhok Governorates (CARE Iraq, 2021), and even among healthcare workers in Kurdistan (Luma, Haveen, Faiq, Stefania, & Leonardo, 2022). This is driven by misinformation regarding the Covid-19 vaccine, which remains widespread among Iraqi communities (Al-Rubaye, Abdulwahid, Ejbary, Al-Rubaye, & Albadran, 2022).

While the overall low vaccination rate in Iraq is of concern, important trends have emerged regarding vaccination and vaccine acceptance pointing to disparities in access and awareness about the vaccine. Iraqis with higher levels of education, with formal public-sector jobs, men, and those in urban areas are more likely to have been vaccinated than that with lower levels of education, with informal private-sector jobs and self-employment, women, and those in rural areas. Most importantly, the vaccination among the elderly, who are most vulnerable, remain very low; even lower than some of the young age groups with less Covid risks. Households' food and financial security are other distinct features for being vaccinated. Poorer Iraqis are significantly less likely to have been vaccinated than wealthier people even though poor people tend to be more at risk of infection as they are more likely to live in large households in cramped conditions and often do informal jobs that require direct interaction with people and less likely to work from home. In contrast, these trends reverse when it comes to vaccine hesitancy. These vulnerable groups also tend to have lesser access to correct knowledge (CARE Iraq, 2021) and high misinformation (Al-Rubaye, Abdulwahid, Ejbary, Al-Rubaye, & Albadran, 2022) regarding the Covid-19 vaccine.

Iraq should focus on increasing access to the Covid-19 vaccine for all its population through a robust and more equitable vaccination strategy. Health system in Iraq was already weakened by the decades of war and conflict and mismanagement of public services and was not prepared to handle the pandemic (Al-Saiedi, 2021). This is reflected by the number of cases and deaths, which remain among the highest in the region. While the government has made some efforts, it should speed up the inoculation process including targeting the elderly, marginalized groups such as IDPs, refugees, informal workers, women, and those from the lower socio-economic groups.

It is equally vital that the government intensifies public education campaigns to counter the widespread misinformation regarding the Covid-19 vaccine. Infections in Iraq, so far, have spiked with the emergence of new COVID-19 variants like Delta and Omicron. The country should aggressively counter the misinformation through effective information campaign and readied itself for the future waves. High prevalence of vaccine hesitancy and misinformation among the most marginalized and vulnerable groups is of concern. Public messaging should be tailored and target these vulnerable groups.

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Annex I: Sampling Design

To ensure representativeness, the sample size for the survey was disaggregated by the 18 governorates with a quota set for each governorate. Given a 4% margin of error and 95% confidence level, the sample size of 1620 was the minimum required to ensure a representative sample across governorates. This was calculated by considering the population proportion, margin of error and the confidence level as follows:

Unlimited population:

Finite population :

Where s score, e margin of error, N population size, p population proportion

A minimum of 1620 households/individuals were interviewed monthly. With approximately 405 interviews carried out every week. The call center applied a random sampling approach to reach the given geographical quotas. Table A presents detailed information about Governorate Population, Target Sample Size and Quotas.

Table A: Governorate Population, Target Sample Size and Quotas

ADM1 Name	Population	Monthly target per governorate	Weekly target per governorate	Bi-weekly target per governorate	Monthly Adjusted Target
Anbar	2,069,768	81	21	42	84
Basrah	3,383,447	126	32	64	128
Muthanna	990,453	34	9	18	36
Qadissiya	1,873,089	66	17	34	68
Najaf	1,653,244	66	17	34	68
Erbil	2,681,017	96	24	48	96
Kirkuk	1,792,045	66	17	34	68
Babil	2,330,682	81	21	42	84
Kerbala	1,470,412	50	13	26	52
Missan	1,338,393	50	13	26	52
Ninewa	4,215,084	154	39	78	156
Salah al-Din	1,628,457	66	17	34	68
Sulaymani-yah	2,282,730	81	21	42	84
Baghdad	8,242,789	262	66	132	264
Wassit	1,548,814	50	13	26	52
Thi-Qar	2,500,447	96	24	48	96
Dahuk	2,703,872	96	24	48	96
Diyala	1,657,588	66	17	34	68
Total	44,362,331	1587	405	810	1620

Note: Population information is from: <https://sedac.ciesin.columbia.edu/data/collection/gpw-v4>

Annex II: Reweighting for the High Frequency Phone Survey in Iraq (IHFPS 2020)

The spread of COVID-19 and government-imposed social distancing practices across the globe has severely limited the use of traditional, face-to-face interviews in population-based surveys to address the data needs. Recently, a more commonly adopted strategy for collecting household survey data is through phone surveys, which do not require face-to-face interactions and can elicit information from individuals and households rapidly and at low cost. Furthermore, these platforms offer flexibility to alter sampling and/or questionnaire design in response to evolving information needs.

The biggest concern with the phone surveys, however, is the lack of national representativeness. Presumably, people who could be more easily reached by phone should have very different characteristics from people with no phone. For example, it is likely that households who own a phone are wealthier than those without. Additionally, households with a phone installed are more likely to reside in urban areas with better infrastructure, whereas households with no phone are more likely to be in remote/rural areas. Therefore, phone surveys only represent a certain group of households with characteristics, thereby failing to be nationally representative.

To address such concern in the Iraq's High Frequency Phone Surveys (IHFPS), we follow the reweighting procedure developed by the World Bank's Poverty and Equity Global Practice.⁷ It calibrates the phone surveys against a nationally representative reference household survey and readjusts the phone survey to make it nationally representative.

The 2018 Multiple Indicator Cluster Survey (MICS) was selected as the reference survey. It is a nationally representative survey with a representative sample at the national and governorate levels of more than 20 thousand families throughout Iraq. The readjustment of the phone survey is done as described below.

1. Household and population weights:

Step 1: Using the population and the monthly sample size (as reported in Annex I), starting or initial population weights are calculated as:

$$popwgt_{ig} = \frac{N_g}{S_g} \quad (1)$$

where, $popwgt_{ig}$ is the starting/initial population weight of household i in governorate g . While N_g is the governorate population, S_g is the number of complete phone interviews in a month from governorate g . Using the average household size in a governorate, $hsize_g$ (from the MICS 2018 survey) we calculate the initial household weights as below:

$$hhwgt_{ig} = \frac{popwgt_{ig}}{hsize_g} \quad (2)$$

and all the subscripts have same meaning as in equation 1.

Step 2: The calculated "initial weights" are then adjusted using the propensity score weighting procedure. The goal is to make the phone survey resemble the distribution of the nationally representative survey as much as possible. To achieve this goal, we need to compare variables that are time-invariant between the two surveys. If these variables are close enough across the two surveys, we can safely conclude that the phone survey has resembled the reference survey quite well, or, the reweighting has been implemented successfully.

⁷ See Annex 2 of "High Frequency Mobile Phone Surveys of Households to Assess the Impacts of COVID-19 Guidelines on Sampling Design", Version: April 29, 2020, which provides various ways to implement re-weighting procedures.

In Iraq, we use the following time-invariant as the target to be matched across surveys:

- household size
- household size squared
- dependent share
- elderly share
- adult category (2 or less, between 3 to 5, 6 or more)
- urban/rural
- accommodation (dwelling ownership)
- residence of region (KRI, North, Center, or South)

Initial weights, from the reference and phone surveys serve as a starting point.⁸ Once, these variables are created in both the surveys, the two dataset are then appended generating a variable named "append", which takes the value of 1 if an observation is from the phone survey and takes the value of 0 if it comes from the reference survey.

Using "append" as the dependent variable, we implement a logit regression with the above listed variables as regressors (variables that are correlated with the respondent's likelihood of being reached by phone). Based on the predicted probability, the combined appended data set is then divided into five quintiles. The rest of the procedure is as follow:

- I. Compute the **quintile-level sum** of predicted probability **for the reference and phone surveys**, respectively.
- II. Compute **the sum** of predicted probability **for both the reference and phone surveys**, respectively.
- III. Divide the quintile-level sum by the survey-level sum of predicted probability for both surveys.
- IV. Divide the quintile-to-total ratio from the reference survey by the quintile-to-total ratio from the phone survey and obtain a new ratio which we name as "**coefficient**".
- V. Generate a new household weight by multiplying the initial household weights from the phone survey by the coefficient:

$$hhwgt_{ig,PSM} = hhwgt_{ig} \times coefficient \quad (3)$$

- VI. Generate a new population weight by multiplying the initial population weight from the phone survey by the coefficient:

$$popwgt_{ig,PSM} = popwgt_{ig} \times coefficient \quad (4)$$

⁸ MICS 2018 survey reports only the normalized weights (the sum of the weights match to total sample size instead of population). In order to create the full weights, we multiply the normalized household weights by a constant - 6,056,089/20,214 (total households in Iraq in 2018/MICS 2018 sample size). Total households in Iraq was identified by dividing the population (as reported in [World Development Indicator \(WDI\)](#)) by average household size. We reproduce Table SR 4.1 "Age distribution of household population by sex" in the [MICS 2018 report](#) using the full weights to access its accuracy. The age distribution matched perfectly with the distribution produced by the normalized weights.

Step 3: PSM adjusted weights are then calibrated to match governorate and other population sums. While the propensity-score-matching-based procedure makes the phone survey closer to “being nationally representative” by overweighing the group of people that were hard to be reached by phone, the population distribution in the phone survey may still differ from the reference survey. At this stage, we implement a procedure named post-stratification or raking to exactly match the governorate-level and other population sums between the reference and phone surveys. To be exact, using the population sums (number of households and individuals for households and population weights, respectively) from the reference survey by (i) governorate; (ii) household size category – between 1 to 3, between 4 to 5, between 6 to 7, between 8 to 9, and 10 or more; (iii) dependency ratio category (number of children/household size) – 0-0.1, 0.1-0.3, 0.3-0.5, 0.5-0.6, and 0.6-1; and (iv) urban population, we use Kolenikov’s (2014; 2019) ipfraking procedure in Stata and calculate post-stratified weights.⁹

Finally, to correct for outliers, we re-run the above ipfraking procedure by controlling for smallest and highest raked weights allowed. While the value of 1st percentile of the post-stratified weight from the previous ipfraking procedure is used as the lower bound, the 99th percentile is used as the upper bound. Weights that are below (above) this lower (upper) bound are increased (trimmed down).

2. Adult weights:

Unlike the regular face-to-face household surveys, the Iraq’s High Frequency Phone Surveys do not collect information on all household members. They elicit household and individual level information from the survey respondents only. Moreover, by design only adult, 18 years or older, are selected as survey respondents. Therefore, to assess individual level indicator such as one’s employment status or labor force participation for adults, the calculated household and population weights are not adequate and need to adjust such that the adult population in the phone survey resemble the adult distribution in the nationally representative survey.

⁹ See Kolenikov, S. 2014, “Calibrating survey data using iterative proportional fitting (raking).” *Stata Journal* 14: 22-59 and Kolenikov, S. 2019, “(Kolenikov, Updates to the ipfraking ecosystem, 2019).” *Stata Journal* 19: 143-184.

To create adult weights, we follow the similar procedure as described in section 1 for household and population weights and make the following adjustment:

Step 1: Since the sampling design did not use the adult population distribution to select the sample and there is no auxiliary data, all the observations are assigned a starting/initial weight of 1 i.e.

$$adultwgt_{ig} = 1 \quad (5)$$

Step 2: Here we follow all the steps as described in section 1, except that the MICS 2018 sample is limited to adults only when appending the two data sets. In addition to the 8 regressors used in section 1, respondents’ age, age squared, gender and education levels are added as extra regressors in calculating one’s propensity to be part of the phone surveys.

Step 3: The PSM adjusted adult weights then are calibrated to match adult population sums by (i) governorate; (ii) household size category; (iii) dependency ratio category; (iv) urban population; (v) region by gender adult population sums; (vi) region by education level (primary, secondary, bachelors or more), and (viii) region by age category 18-24, 25-29, 30-39, 40-49, 50-59 and 60 or more) population sums. Again, the outliers are corrected as described in section 1.

All three full (raw) sample weights are then standardized (or normalized) to make the weighted sum of the interviewed sample units equal to the total sample size. Normalization is done by multiplying the full sample weights by a constant factor equal to the unweighted number of total completed interviews (sample size) divided by the weighted total number of completed interviews i.e., total households, individuals, or adults.



