

UDC: 338.1

## COVID-19 IMPACT TO FAMILY FOOD CONSUMPTION AND INCOME IN UZBEKISTAN: RESULTS OF AN ONLINE SURVEY

*Kh. Pardaev - PhD student, Tashkent State University of Economics*

*Sh.Hasanov - D.Sc., director, S.Mamasoliev - researcher, Samarkand branch of Tashkent State Agrarian University*

*Sh.Muratov - PhD, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers*

*R.Kalandarov, U.Nurullaev - researcher, Samarkand branch of Tashkent State Agrarian University*

### Abstract

This article aims to study the impact of the pandemic on food consumption by families in Uzbekistan. The shock of the pandemic is threatening the well-being of families in Uzbekistan, as in all developing countries. The study focuses on the effects of changes in food prices, declining consumption, and changes in household incomes. The Instrumental regression model was used in the factor impact analysis. Data for analysis were collected online by messenger groups from families in urban and rural areas of Uzbekistan. Results of the Econometric analysis demonstrated that the decline in food consumption in households was assessed by a decrease in income, a growth in total expenditures, and debt factors. The declining food supply in rural areas did not have a significant impact on consumption, but this figure was higher in urban regions.

**Key words:** COVID-19, family borrow, food consumption, income

## ЎЗБЕКИСТОН ОИЛАЛАРИДА ОЗИҚ-ОВҚАТ МАҲСУЛОТЛАРИ ИСТЕЪМОЛИ ВА ДАРОМАДИГА COVID-19 НИНГ ТАЪСИРИ: ОНЛАЙН СЎРОВНОМА НАТИЖАЛАРИ

*Х.Пардаев - докторант, Тошкент давлат иқтисодиёт университети*

*Ш.Ҳасанов - и.ф.д., директор, С.Мамасолиев - илмий ходим*

*Тошкент давлат аграр университети Самарқанд филиали*

*Ш.Муратов - докторант*

*Тошкент ирригация ва қишлоқ хўжалигини механизациялаш муҳандислари институти*

*Р.Қаландаров-илмий ходим, У.Нуруллаев - илмий ходим, Тошкент давлат аграр университети Самарқанд филиали*

### Аннотация

Ушбу мақола пандемиянинг Ўзбекистондаги оилалар озиқ-овқат маҳсулотларини истеъмол қилишига таъсирини ўрганишга қаратилган. Пандемиянинг салбий таъсири барча ривожланаётган мамлакатлар сингари Ўзбекистондаги оилалар фаровонлигига таҳдид солмоқда. Мақолада озиқ-овқат маҳсулотлари нархларининг ўзгариши, истеъмолнинг пасайиши ва уй хўжаликлари даромадларининг ўзгаришига омиллар таъсири тадқиқ қилинган. Омиллар таъсирини таҳлил қилишда Инструментал регрессия модели ишлатилган. Таҳлил қилиш учун маълумотлар онлайн равишда Ўзбекистоннинг шаҳар ва қишлоқларидаги оила бошлиқларидан ижтимоий тармоқлар орқали олинди. Эконометрик таҳлил натижалари шуни кўрсатдики, уй хўжаликларида озиқ-овқат истеъмолининг пасайиши даромадларнинг пасайиши, умумий харажатларнинг ўсиши ва қарз омиллари билан баҳоланди. Қишлоқ жойларида озиқ-овқат таъминотининг пасайиши истеъмолга сезиларли таъсир кўрсатмаган, аммо бу кўрсаткич шаҳар ҳудудларида юқори бўлган.

**Таянч сўзлар:** COVID-19, оилавий қарз, озиқ-овқат истеъмоли, даромад.

## ВЛИЯНИЕ COVID-19 НА ПОТРЕБЛЕНИЕ ПРОДУКТОВ ПИТАНИЯ И ДОХОД СЕМЕЙ В УЗБЕКИСТАНЕ: РЕЗУЛЬТАТЫ ОНЛАЙН-ОПРОСА

*Х. Пардаев - докторант, Ташкентский государственный экономический университет*

*Ш.Гасанов - д.т.н., директор, С. Мамасолиев - научный сотрудник*

*Самаркандский филиал, Ташкентский государственный аграрной университет*

*Ш.Муратов - докторант, Ташкентский институт инженеров ирригации и механизации сельского хозяйства*

*Р. Каландаров - научный сотрудник, У.Нуруллаев - научный сотрудник*

*Самаркандский филиал Ташкентского государственного аграрного университета*

### Аннотация

Эта статья направлена на изучение влияния пандемии, на потребление продуктов питания в семьях Узбекистана. Как и во всех развивающихся странах, шок от пандемии угрожает благополучию семей в Узбекистане. Основное внимание в исследовании, уделяется влиянию изменений цен на продукты питания, снижения потребления и изменений доходов домохозяйств. При факторном анализе воздействия использовалась модель инструментальной регрессии. Данные для анализа были собраны онлайн группами в мессенджерах, по данным полученным от семей из городских и сельских районов Узбекистана. Результаты эконометрического анализа показали, что снижение потребления продуктов питания в домохозяйствах оценивалось по снижению доходов, росту общих расходов и долговым факторам. Уменьшение предложения продуктов питания в сельской местности не оказало значительного влияния на потребление, но этот показатель был выше в городских районах.

**Key words:** COVID-19, семейные займы, потребление продуктов питания, доход.



**Introduction.** COVID-19 pandemic ripple is affecting to the almost each of sectors in all countries in the world. Especially, staple food supply chain sector and monetary policy of developing countries have lost its stability (ADB, 2020). Lockdown policies are leading families to food insecurity and malnutrition in the countries (FAO, 2020). At the same time, during this period, the purchasing power parity of food products in these countries has decreased (Wyplosz, 2020), food prices have risen (Food Security Information Network, 2020), employers have cut jobs and unemployment has increased for many temporary workers (Acs and Karpman, 2020).

Like all developing countries, since the outbreak of the COVID-19 pandemic in Uzbekistan (March, 2020), the family food supply system has been disrupted and all sectors have been suspended due to lockdown policies, and incomes have declined (OECD, 2020). The government is taking a number of measures to mitigate the effects of the COVID-19 pandemic with the financial support of a number of international organizations and local funds.

This study aims to pearn the impact of the COVID-19 pandemic in Uzbekistan on family incomes and their food consumption. Section 2 provides a brief literature review on the role of social protection and families` state to access for food consumption in blunting shocks. Section 3 presents the lockdown policies in Uzbekistan. Section 4 describes the conducted key data and methodology employed. Section 5 presents results with a focus on family food consumption and borrowing. Section 6 summarizes and concludes, marking the starring role of social protection and measures to wellbeing family food consumption.

**Pandemic shocks and its consequences.** The shocks of the COVID-19 pandemic have caused great losses not only for the economies of developing countries, but also for households. (Diao & Mahrt, 2020; FAO, 2020a). Due to the pandemic lockdown introduced to prevent the spread of the disease, the sharp increase in demand for food and medicines in the initial stage, stationery, education, business agreements and other communication converge to remote - virtual implementation, unemployment rate increased, amount of remittance decreased and other such similar shocks increased sharply. The unbalance in the economy has increased. In low-income families and those with low levels of education (mainly those working part-time and seasonal jobs), the risk of food insecurity has increased due to low incomes. (Arndt et al., 2020; Siman et al., 2020). Besides that, as Béné, (2020) points out, in low and middle income countries, two generalized problems, namely structural issues and shocks and stressors, have led to the physical and economic disruption of the food supply chain for families. As a result, the level of shock to food security in these countries has increased, and the price gap in urban and rural areas has widened. As a result, there are socio-economic risks associated with the negative consequences of the pandemic. Studies have shown that pandemic shocks have reduced food purchases due to reduced household incomes. (Arndt et al., 2020; Qian & Fan, 2020; Barker & Russell, 2020). At the same time, the level of indebtedness has increased in most vulnerable families (Crossley et al., 2020). Unemployment has risen due to rising unemployment in the seasonal and temporary workforce, resulting in an increase in criminal activity and anti-social behaviour (Ejiogu et al., 2020). This means that if the pandemic continues for a long time period, it will be difficult to stop or eliminate anti-social behaviour. (FAO, 2020a).

Another important sector related to food supply is international trade. International trade is the most important

component that ensures the balance of food supply of countries (Udmale et al., 2020a), therefore, a decrease in supply will lead to a rise in prices and a reduction in consumption due to increased trade restrictions in import-dependent countries (Udmale et al., 2020b) and such countries automatic links to the external economic shocks (Hickey & Unwin, 2020). Pandemic shocks test humanity's readiness for various adverse events in the future, as well as urge them to take precautionary measures in the future.

**Lockdown policy in Uzbekistan.** Decree of the President of the Republic of Uzbekistan dated January 29, 2020 No F-5537 "On the establishment of the Republican Special Commission to prepare a program of measures to prevent the entry and spread of a new type of coronavirus in the Republic of Uzbekistan", measures to prevent the entry and spread of coronavirus in the Republic of Uzbekistan have been prepared since the early detection of COVID-19 infection in China. Despite strict control measures, the infection entered the territory of the Republic of Uzbekistan in March 2020. The government quickly took drastic measures to prevent the spread of this dangerous infection. Since then, on March 24, 2020, the government has imposed a number of restrictions:

Regular flights between all countries of the world and the Republic of Uzbekistan, as well as passenger traffic have been suspended; Persons entering the territory of the country were quarantined for 14 days in a specially allocated medical institution or on the bases adapted for the organization of quarantine measures; Stopped the operation of entertainment facilities and all kinds of public events;

The state higher education institutions, general secondary, secondary special, out-of-school and pre-school educational institutions, as well as all non-governmental educational institutions have suspended the educational process and introduced an online education system.

In order to combat the spread of coronavirus infection and other macroeconomic stability in the face of other global threats, to ensure the uninterrupted operation of sectors and industries, to stimulate foreign economic activity, to provide effective social support and to prevent a sharp decline in incomes, Decree of the President of the Republic of Uzbekistan sets out to take initial measures to mitigate the negative impact of the coronavirus pandemic and the global crisis on the economy .

**Data and methods.** *Study design and data collection.*

In the context of the COVID-19 pandemic, cross-sectional data collection poses many challenges for all researchers. It is difficult to determine the impact of the pandemic consequences on social spheres, which has put all people on the planet is a tough 'lockdown' situation. Therefore, we tried to conduct an online survey on the impact of the COVID-19 pandemic on household food consumption in Uzbekistan. It was obtained anonymously and at random by the Survey Monkey online platform privacy policy (<https://www.surveymonkey.com/mp/legal/survey-research-privacy-notice/>).

The content and condition of the online survey as follows: the survey was designed to assess eight multidimensional lifestyle behaviours sections during the COVID-19 outbreak. The online survey questions were in the Uzbek language, and names and contact information were not received from respondents. Those who did not want to fill out the questionnaire voluntarily could stop at any stage. Only the data of the respondents who clicked the 'Yakunlash(complete)' submit button was collected automatically.

**Survey tool.** The survey consisted of 38 questions and sub-questions separated with demographic (12 questions),

property (7 questions), food consumption satisfaction (6 questions), physical expectation (1 question), family income and expenses changes (8 questions), social support (2 questions), free time activities and infected to COVID-19 (2 questions) multi-sections.

The first section focuses on the socio-demographic data of respondents. The questions were mainly related to education, living place, age, marital status, and the number of children, spent the time on children's care, type and field of working activity. The second property section focuses on that the householders produce agri-food products on their house yard and the time they spend on the farm management during the pandemic, as well as changes in income from that activity. The questions in the food consumption satisfaction section are regarded as changes in the amount and timing of food consumption in the family. In the family income and expenses changes section, the questions are designed to determine the family's income and expenses, the amount of their change, and the debts received. Other sections of the survey included questions about respondents' access to social assistance, weight changes, leisure activities, and exposure to the virus. The answers to the questions were marked in dummy, nominal, and ratio indicators.

The responses of the dependent and independent variables selected to study the impact of the COVID-19 pandemic on family food consumption were as follows. (Table 1). (1) The academic background of the respondents was mainly determined by 4 answer options. Because in Uzbekistan, secondary school education is compulsory and the following stages are defined as independently: Vocational college, High school, and Ph.D. (Ganiev et al., 2018). Respondents were asked to indicate their academic backgrounds in the first three and were left to enter them if they had another high level. (2) Respondents were divided into 3 age groups. At the same time, mainly young-aged people (young people - 18-30), middle-aged people (31-60), and the elderly (people of retirement age - over 61 years) were identified. This is because the main age boundaries are divided into the above groups for implementing family and home activities (Liu et al., 2016; Brajša-Žganec et al., 2011). (3) In the context of the pandemic, it is given three answer options to determine affect families' food consumption: the family food consumption was not affected; a decrease in purchases due to rising prices; and a decrease in consumption due to a decrease in product supply were identified as response options. According to scientists, the rise in food prices during the pandemic can be observed more in developing and importing countries (FAO, 2020d; IFPRI, 2020a; Akter, 2020), and there is a possibility of a shortage in staple food in stores or a decrease in food supply (IPES-Food, 2020; FAO, 2020f). (4) At a time when the panic of the pandemic is confusing people, the demand for high-protein foods would be particularly high (Arora & Mishra, 2020). According to Muscogiuri et al. (2020), it is advisable to consume well and eat more foods that contain serotonin, melatonin, minerals, antioxidants, and vitamins to prevent COVID-19 infection. People focus on better nutrition to strengthen the body and boost immunity. Given the above, the survey asked about the unchanged or decreased consumption of meat products. (5) Various factors can affect the change in the amount of food purchased in the family. In particular, the funds for the purchase, the decrease in the supply of products, high prices, and so on. According to the recommendations of Udmale et al., (2020) to the governments of developing countries on measures to mitigate the negative effects of the pandemic, attention should be paid to the

purchasing power of households. Therefore, to determine this situation in the survey, we offered respondents three different response options (No change, increased, and decreased). (6) The income of the population is one of the main factors influencing changes in the volume of consumer goods (Ren et al., 2019). Its increase will surge consumer spending (Siman et al., 2020). The survey looked at the impact of income on household food as a particular factor and suggested three possible responses. (7) Another factor is related to changes in family expenses. In order to determine its change and impact, respondents were also offered three different answer options. (8-9) The responses were dummy (1=yes, 0=no) in order to determine whether the family had sufficient income for food and borrowed money from other entities for family expenses. (10) Respondents were divided into two classes (married and unmarried) according to their marital status.

*Data analysis.* The data analysis was performed using Microsoft Excel 2010 and STATA version 15. Collected data by Survey Monkey online survey platform transferred to Microsoft Excel 2010 for editing, sorting, and coding. The prepared excel file data was then imported into STATA V.15 software. Descriptive statistics (frequencies, percentages, means, and standard deviation), some first-order and regression model were executed by STATA software. According to the dependent variable the instrumental variable (IV) regression was performed with a 95% confidence interval to determine significant associations between categorical dependent and independent variables. The food consumption change variable was taken as a dependent variable in the model. Outcome measures in this analysis are the impact to change family food consumption during the COVID-19 pandemic – no change, food prices have risen, so our purchases have decreased and shortage of food for purchases – from which we are going to see what relationships exist with a set of independent variables (income for food purchases, education, age, living place, protein intake, food purchase change, family overall income, family overall expenses, marital status and borrow). We select the 'No change' outcome measure of the dependent variable as a base. In the analysis, family income was identified as a basic independent variable. Family debt was taken as an external factor influencing changes in income.

**Results.** The online survey results show that of the total questions in the questionnaire, only those with high Pearson's correlation coefficient (Pearson's Product of Moments, or PPM) were analysed for econometric analysis and used as independent variables. Below are the responses of respondents in Table 1.

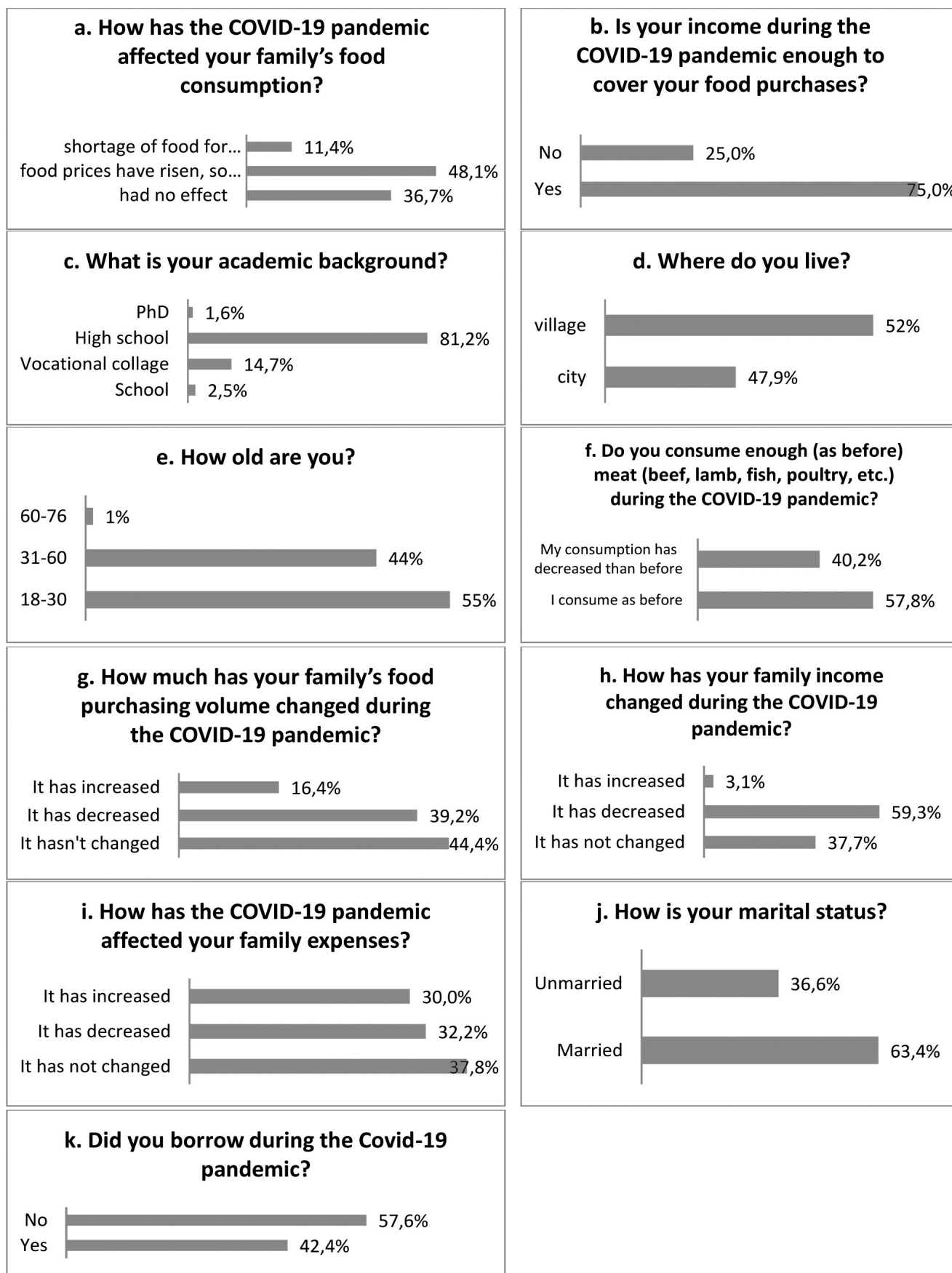
In order to determine the impact of the COVID-19 pandemic on changes in food consumption, 48,1% of respondents answered "food prices have risen, so our purchases have decreased". However, 36,7% of respondents said there was no change (a). Even though, in another question, 75% of respondents indicated that their income was sufficient for food consumption (b).

Academic background, living place and age groups of respondents were selected on the given demographic questions. According to their responses, 81,2% of respondents had higher education (c). At the same time, the majority of respondents, or 52%, live in rural areas (d). We studied the age of the respondents in three groups, as a result of which those aged 18-30 accounted for 55% of the respondents. Middle-aged people accounted for 44% of the total respondents (e).

57.8% of respondents reported no change in consumption of protein-rich products, but 40.2% of respondents reported a

Table 1

## Respondents' answers for the questions on COVID-19 pandemic affects



decrease in protein intake. Another group of respondents left the question unanswered (f). Changes in household income affect changes in the amount of food consumption goods or purchases in the family. Three alternatives were identified in the analysis of how households were affected by food consumption during the Covid-19 pandemic. While 44.4% of respondents reported no change in food purchases, 39.2% of respondents reported a decrease in food consumption (g).

During the COVID-19 pandemic, the income of 59.3% of respondents decreased. Of these, the family income of 678 respondents decreased by an average of 40%. The decline in household incomes was influenced by quarantine restrictions imposed on production and some non-production

dependent variable. The main independent variable was "Income food purchases", and the instrument variable was "Borrow".

The results of the econometric analysis show that in Table 2, to family food consumption change income food purchases, education degrees, respondents living place, their age, protein consumption, food purchase change, family expenses and marital status variables are significantly impacted. A decrease in income food purchases among the population reduces family food consumption by 38,2%. The increase in protein consumption by one unit upgrade the family food consumption by 22,9% and the increase in food purchases proliferate by 12,7%.

Table 2

**Instrumental variables regression model results on analyse of family income and food consumption change during COVID-19 in Uzbekistan**

Family food consumption change (fcons)	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
Income food purchases (infpurch)	-0.382	0.166	-2.290	0.022	-0.708	-0.055
Respondent education (educ)	0.071	0.040	1.760	0.078	-0.008	0.151
Respondent live place(place)	-0.082	0.041	-2.010	0.045	-0.163	-0.002
Respondent age (age)	-0.005	0.003	-1.970	0.049	-0.011	-0.000
Protein consume (pcons)	0.229	0.050	4.610	0.000	0.132	0.327
Food purchase change (fpurch)	0.127	0.031	4.090	0.000	0.066	0.189
Family income change (faminchange)	0.076	0.049	1.550	0.120	-0.020	0.172
Family expanses change (fexchange)	0.094	0.030	3.130	0.002	0.035	0.152
Marital status (ms)	0.128	0.052	2.450	0.014	0.026	0.231
Constant	0.477	0.210	2.280	0.023	0.066	0.888
Number of Observations	911					
Prob > F	0.0000					
Centered R2	0.1514					
Uncentered R2	0.6130					
Underidentification test (Anderson canon. corr. LM statistic):	80.927					
Chi-sq(1) P-val	0.0000					
Weak identification test (Cragg-Donald Wald F statistic):	87.841					
Sargan statistic (overidentification test of all instruments):	0.000					
(equation exactly identified)						
Instrumented: Income food purchases (infpurch)						
Included instruments: educ place age pcons fpurch faminchange fexchange ms						
Excluded instruments: borrow						

Source: Computed from an online survey data on COVID-19 impact to family income and food consumption in Uzbekistan.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

sectors in the private segment. However, the introduction of online service platforms in organizations in a pandemic environment has not affected the change in family income without affecting the wages of employees working in the field. In 32 of the respondents surveyed, family income increased by an average of 37%. During the Covid-19 pandemic, it was found that the performance of certain types of services (food and non-food products) in compliance with quarantine regulations had a positive effect on the stability or increase in incomes of workers (h). Changes in total family expenses were increased by 30% of respondents, while decreased by 32.2% of others (i). As the population loses jobs and income during the COVID-19 pandemic, they will be forced to borrow money to survive. On that case, the survey found that 42.4% of the total respondents were borrowed (k).

Using the data from the online survey, we conducted an econometric analysis to determine changes in family income and food consumption. In the regression analysis we used the Instrumental variables regression model. In the model, "Family food consumption change" was selected as the main

**Discussion and conclusion.** As observed in other developing countries, the lockdown policy measures in Uzbekistan have led to a reduction in household food consumption and a decrease in income. According to the respondents in the online survey, food prices have risen. One of the reasons for this is that in the early stages of the pandemic, due to pandemic shocks, the populations' demand for products for the quarantine period is increased. According to the above data, the majority of respondents had higher education. This means that the population of Uzbekistan with higher education actively participates in social events and online platforms. At the same time, in the population, young people are more active in social networks than adults.

Total household expenditures increased by one-third of respondents, while decreased by another one-third. The literature cited cases of cost savings in families that did not leave their homes and whose salaries were retained. In Uzbekistan, also, most families have saved some costs (eg, transportation, fuel, other consumer goods, etc.).

The analysis shows that the change of family food

consumption had a negative impact on the decline in income, that is, a decrease in household income per unit of income had a negative impact on consumption by 38%. During the pandemic, urban living reduced consumption by 8.2% and the older age of the family head by 0.5%. As the education rate increases, consumption increases by 7.1%, due to an increase in protein consumption by 22.9%, improved food

purchases by 12.7%, an increase in total expenditures by 9.4% and non-single families increased by 12.8%.

In conclusion, pandemic shocks reduce incomes and the ability to pay for consumer goods. Consumption problems in rural areas are lower than in urban areas. This is because the possibility of agricultural production and self-sufficiency of staple food exists in rural areas.

#### References

1. Acs, G., & Karpman, M. (2020). Employment, Income, and Unemployment Insurance during the COVID-19 Pandemic. 1–11.
2. ADB. (2020). NAVIGATING COVID-19 IN ASIA AND THE PACIFIC (Issue September).
3. Arndt, C., Davies, R., Gabriel, S., Harris, L., Makrellov, K., Robinson, S., Levy, S., Simbanegavi, W., van Seventer, D., & Anderson, L. (2020). Covid-19 lockdowns, income distribution, and food security: An analysis for South Africa. *Global Food Security*, 26(May), 100410. <https://doi.org/10.1016/j.gfs.2020.100410>
4. Barker, M., & Russell, J. (2020). Feeding the food insecure in Britain: learning from the 2020 COVID-19 crisis. *Food Security*, 865–870. <https://doi.org/10.1007/s12571-020-01080-5>
5. Béné, C. (2020). Resilience of local food systems and links to food security – A review of some important concepts in the context of COVID-19 and other shocks. *Food Security*, 805–822. <https://doi.org/10.1007/s12571-020-01076-1>
6. Crossley, T. F., Fisher, P., & Low, H. (2020). The Heterogeneous and Regressive Consequences of COVID-19: Evidence from High Quality Panel Data. *Journal of Public Economics*, 193, 104334. <https://doi.org/10.1016/j.jpubeco.2020.104334>
7. Diao, X., & Mahrt, K. (2020). Assessing the impacts of COVID-19 on household incomes and poverty in Myanmar: A microsimulation approach (Vol. 2). *Intl Food Policy Res Inst.*
8. Ejiogu, A., Okechukwu, O., & Ejiogu, C. (2020). Nigerian budgetary response to the COVID-19 pandemic and its shrinking fiscal space: financial sustainability, employment, social inequality and business implications. *Journal of Public Budgeting, Accounting and Financial Management*, 32(5), 919–928. <https://doi.org/10.1108/JPBAFM-07-2020-0101>
9. FAO. (2020a). COVID-19 and indigenous peoples. In COVID-19 and indigenous peoples (Issue August). <https://doi.org/10.4060/ca9106en>
10. FAO. (2020b). COVID-19 and rural poverty (Issue April). <http://www.fao.org/publications/card/en/c/CA8824EN>
11. FAO. (2020c). Urban food systems and COVID-19: The role of cities and local governments in responding to the emergency (Issue April). <http://www.fao.org/documents/card/en/c/ca8600en>
12. Food Security Information Network. (2020). Global Report on Food Crises. *Fao.Org*, 1–202. <https://www.wfp.org/publications/2020-global-report-food-crises>
13. Hickey, G. M., & Unwin, N. (2020). Addressing the triple burden of malnutrition in the time of COVID-19 and climate change in Small Island Developing States: what role for improved local food production? *Food Security*, 831–835. <https://doi.org/10.1007/s12571-020-01066-3>
14. Kahiluoto, H. (2020). Food systems for resilient futures. *Food Security*, 853–857. <https://doi.org/10.1007/s12571-020-01070-7>
15. OECD. (2020). COVID-19 Crisis Response in Central Asia (Issue June). <https://doi.org/https://www.hSDL.org/?view&did=839729>
16. Qian, Y., & Fan, W. (2020). Who loses income during the COVID-19 outbreak? Evidence from China. *Research in Social Stratification and Mobility*, 68(June), 100522. <https://doi.org/10.1016/j.rssm.2020.100522>
17. Siman, S., Tawakal, M. A., Risamasu, P. I. M., & Kadir, R. (2020). Effect of household size, working hours, health and income on consumption expenditure of poor household. *Enfermería Clínica*, 30, 512–515.
18. Udmale, P., Pal, I., Szabo, S., Pramanik, M., & Large, A. (2020a). Global food security in the context of COVID-19: A scenario-based exploratory analysis. *Progress in Disaster Science*, xxxx, 100120. <https://doi.org/10.1016/j.pdisas.2020.100120>
19. Udmale, P., Pal, I., Szabo, S., Pramanik, M., & Large, A. (2020b). Global food security in the context of COVID-19: A scenario-based exploratory analysis. *Progress in Disaster Science*, 100120. <https://doi.org/10.1016/j.pdisas.2020.100120>
20. Wyplosz, C. (2020). 14 The good thing about coronavirus, book: Economics in the Time of COVID-19. [www.cepr.org](http://www.cepr.org)