A General Framework for Holodomor Research

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Status of Holodomor research

   According to Kulchytskyi (2015, p. 88) "the number of works devoted to the Ukrainian Holodomor has surpassed 20,000 titles." This would indicate that the Holodomor has been thoroughly researched, is well known and well understood. However, this is definitely not the case. Among the general population of almost all countries of the world the Holodomor is practically unknown, it is very little known in the scholarly community with the exception of a limited number of specialized scholars and there is even no consensus about the meaning of the term Holodomor and of key concepts like Holodomor losses.

   Several technical and political factors are responsible for this situation. Among technical factors we have: a) there are no precise and accepted definitions of key concepts, beginning with the Holodomor itself[1]; b) a large part of scholarly work on the Holodomor has been published in Ukrainian and in not easily accessible journals and books; c) most research has focused on Soviet Ukraine (also UkrSSR or Ukrainian Soviet Socialist Republic) and the Kuban region in North Caucasus, and little comparative research has been done on the effects of the 1932-1933 Famine in other parts of the Soviet Union. Several political factors have also hindered the dissemination of research on the Holodomor. First, the Soviet government denied for years the existence of the Holodomor and later the Soviet government and now the current Russian government have been engaged in an active campaign of disinformation about the event. Second, scholarly research has been influenced by the ideological leanings of individual researchers. Third, articles about the Holodomor from the nationalist perspective have often encountered ideologically motivated negative reviews, making their publication more difficult in peer-reviewed journals. Fourth, there has been opposition to teaching about the Holodomor in schools and strong resistance at different levels to the recognition of Holodomor as genocide.

   Holodomor research has been affected by two key problems. First, access to relevant data and documents was closed for many years by the Soviet government; archives were only open in late 1980s. Thus, for many years research was based on very limited data and it has taken years for researchers to start building a body of relevant data and documents. As more data became available it was possible to apply better estimation methods, refine previous results and address new questions. When evaluating Holodomor research it is important to note the time when the research was done and what data and documents were used. Sometimes the same researcher revised more than once his results and produced new numbers (Maksudov 1983, 1989, 1991, 1992, 1995).

   Second, only recently researches started doing comparative research on the effects of the 1932-1933 Famine in the UkrSSR and other Soviet Republics (Rudnystkyi et al. 2015a; Cameron 2018; Levchuk et al. 2018b; Wolowyna et al. 2018).

Estimates of the number of Holodomor losses vary between 2.6 and 5.0 million, with one outlier of 7 million. Besides disagreements on the definition of "Holodomor losses", there are at least two reasons for this wide range in the estimates of Holodomor losses: a) insufficient data; b) lack of technical expertise.   Insufficient data forced researchers to use less adequate methodologies based on untested assumptions. Although now we have almost all the data needed for making reliable estimates of Holodomor losses, some researchers keep using inadequate methodologies due to lack of demographic and statistical expertise. The estimation of Holodomor losses in particular (and famine losses in general) is a demographic problem and demographers have the best qualifications to deal with this technical problem. Other disciplines, like history, can make valuable contributions to the study of the Holodomor by helping validate and/or interpret demographic results, suggesting hypothesis that can be tested with quantified methods or providing documents that may support, invalidate or refine demographic results.

We suggest that it is time to start a process of synthesis of the current knowledge about the Holodomor and formulate a framework for a more systematic study of this event. This framework can have several purposes: a) evaluate what has been done so far; b) provide guidelines for a synthesis of the accumulated knowledge; c) propose a formal mechanism for testing hypothesis about factors responsible for the Holodomor and a baseline for explaining consequences of the Holodomor; d) pinpoint gaps in the existing knowledge; e) provide a roadmap for future research; f) clarify the role of demography and other disciplines in an intersdisciplinary approach to Holodomor research. The main objective of this paper is to propose the elements of such a framework.

We limit our analysis to rural areas of Ukraine and to direct losses or excess deaths. The dynamics of the Holodomor and its effects in rural areas are quite different to those in urban areas and need to be analyzed separately. Indirect losses or lost births present research challenges that have not been adequately researched so far.

A Framework for Holodomor Research

For many years the Holodomor has been researched mainly by historians and demographers. In recent years it has become the subject of research by other disciplines like economics (Naumenko 2018), political science (Rozenas and Zhukov 2018), psychology (Brent 2017), epidemiology (Lumey et al. 2015) and ethnography (Noll 1999). Our framework is focused primarily on the role of demography, but provides the basis for integrating other disciplines, especially history, in an interdisciplinary approach to Holodomor research.

As a first step, it is important to define the key concepts of Holodomor and Holodomor losses. We define Holodomor as the famine in Soviet Ukraine during 1932-1934[2]. It should be noted that the origin of the term Holodomor is ideological, not scientific. "The writer and civic activist Ivan Drach is usually credited with popularizing the term 'Holodomor' meaning - 'extermination by hunger' – from *moryty holodom*." (Andriewska 2015, p. 15). It has the connotation that the 1932-1933 famine in Ukraine was a man-made famine and that the famine was an instrument of terror against Ukrainians and/or Ukraine. This definition of Holodomor excludes all deaths outside the 1932-1934 period, and other famines like the one in 1921-1923 are not included. It also excludes effects of the 1932-1934 famine outside of Soviet Ukraine.

The definition of Holodomor has direct bearing on the definition of Holodomor losses and their estimation. Direct losses are deaths caused by or related to the Holodomor, in addition to

expected deaths had there been no famine. They are calculated as the difference between the **actual total** number of deaths and the expected number of deaths had there been no famine.

The estimation of losses is not easy and requires specialized demographic expertise. In principle, the estimation of the expected number of deaths had there been no famine is not complicated; it can be estimated by extrapolating mortality trends before the Holodomor or interpolating mortality levels on "normal" years before and after the Holodomor. The estimation of the actual total number of deaths during the Holodomor, on the other hand, is complicated due the fact that a very high proportion of deaths were not registered, especially in 1933, and it is not easy to estimate levels of this under registration.

The best approach for estimating famine loses is based on the methodology of population reconstruction, which consists in making yearly estimates of actual values of the following population components: population, births, deaths and net migrants. This methodology requires a very complete set of data: censuses before the after the Holodomor period, yearly time series of birth and deaths, yearly data on net migration and, in the case of estimations of losses for urban and rural areas, data on reclassification from rural-to-urban and urban-to rural areas. As a first step, all data need to be carefully analyzed and adjustments made whenever necessary. Available data for Soviet Ukraine allow us to apply this methodology and produce fairly accurate estimates of Holodomor losses.

We propose the concept of famine **losses** as the key organizing variable of the Holodomor Framework. The absolute number of losses may have political and symbolic value, but for analytical purposes it is more useful to use relative deaths, i.e., standardized by population size. For example, if we use absolute numbers of deaths to evaluate the magnitude of a famine, the famine in Communist China caused by Mao's Great Leap Forward acquires extraordinary proportions due to China's extremely large population, while the Armenian famine may seem minuscule given the small population size of Armenia at that time.

The popular approach of analyzing the Holodomor (or any famine) using absolute or relative (per 1,000 population) numbers of **officially registered** deaths has several problems. Rudnytkyi et al. (2015b) have shown that death registration in Soviet Ukraine experienced high levels of under registration during the Holodomor. This was especially the case in 1933, when more than half of all deaths went unregistered. Thus, by using registered death we underestimate the level of mortality during the Holodomor by an unknown degree. A second problem is that registered deaths contain two kinds of deaths: the "normal" deaths that would have occurred had there been no Famine and the additional deaths caused by the Famine. Losses estimate the number of deaths caused by or related to the famine and, by excluding the "normal" deaths, provide a measure of the net impact of the Holodomor on mortality.
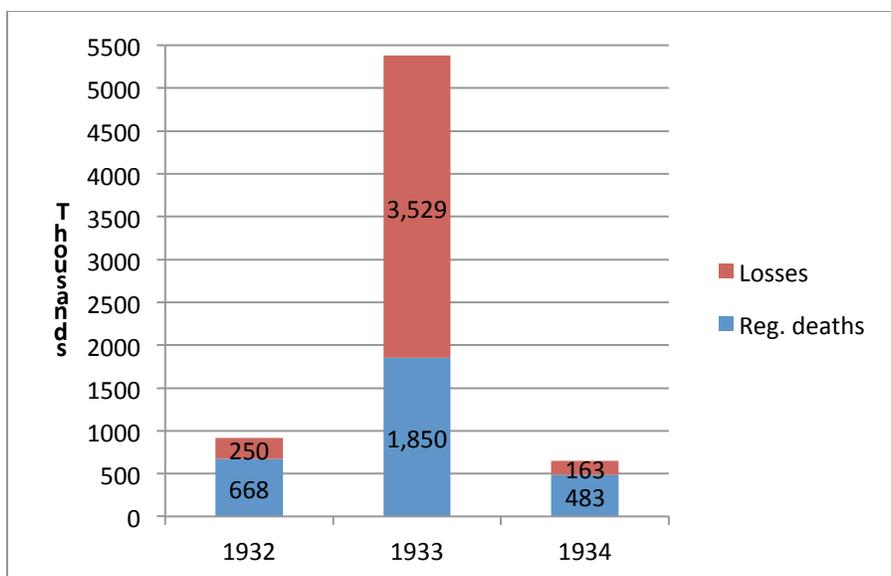
Figure 1. Numbers of yearly registered deaths and losses (in thousands):
Soviet Ukraine 1932-1934

   Figure 1 illustrates the concept of losses, which is often misunderstood. It shows estimated
yearly numbers of "normal" deaths and losses for Soviet Ukraine during 1932-1934. We see that
in 1932 the number of registered deaths was 668 thousand and the number of losses 250
thousand, while in 1934 the respective numbers were 483 and 168 thousand. In 1933, however,
the number of registered deaths was 1.85 million and the number of losses was 3.5 million. This
gives us a total of 5.4 million of deaths in 1933 with 66 percent of them not registered.

   There are further complications when using registered deaths instead of losses at the
subnational level. First, the proportion of "normal" deaths in the total number of registered
deaths varies by region. Second, the level of under registration also varies by region. This is
illustrated by the following example. Local vital statistics offices in Soviet Ukraine called
ZAKHs, sent every month reports of tabulated registered deaths (as well as births) to their raion
office, then consolidated raion reports were sent to the oblast office and consolidated oblast
reports were sent to the country's capital Kharkiv.

   Figure 2 shows the percent of rural ZAKHs in each oblast that did not send a monthly report at
least one month during 1933. Besides the deaths that were not registered in the submitted
monthly reports, data for whole months were missing in all oblasts in 1933. There are very large
differences in percent monthly reports missing among the different oblasts, from two percent in
Vinnytsia and Odesa oblasts to 22 and 23 percent in Donetsk and Dnipropetrovsk oblasts,
respectively. This is clear indication that regional registered deaths were affected by substantial
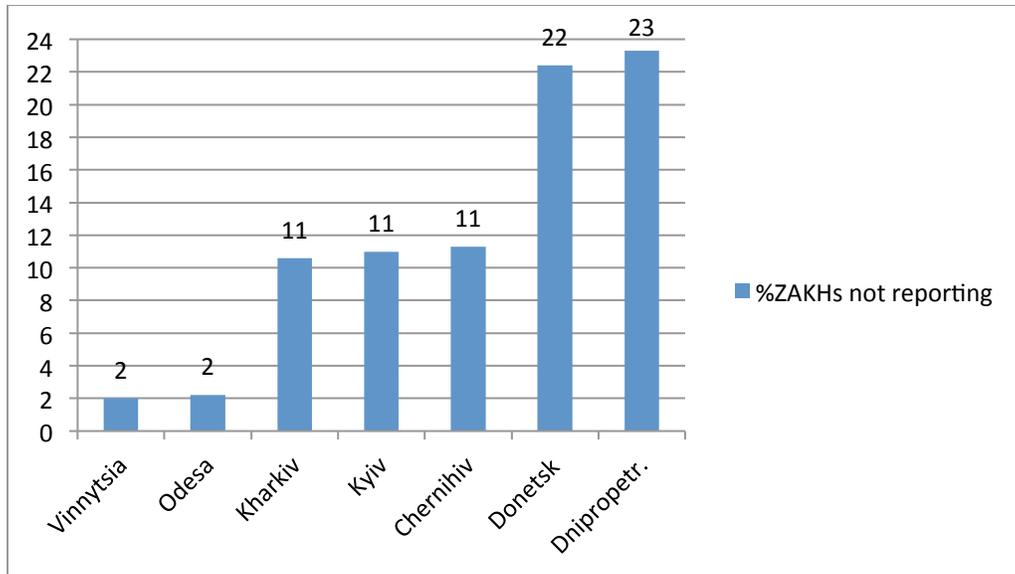differences in the level of under registration of deaths.

Figure 2. Percent of rural ZAKHs not reporting at least one month in 1933, by oblast

   As mentioned above, losses are measured as the difference between the actual total number of deaths and the estimated number of deaths had there been no famine. The actual total number of deaths is derived from population reconstruction, by adjusting registered deaths for under registration; this eliminates the problem of under registration in registered deaths. By subtracting from the total number of deaths the estimated number of deaths had there been no famine we eliminate the second problems with registered deaths, i.e., that they also capture deaths that would have occurred had there been no famine.

   We divide Holodomor research into three categories or modules: before, during and after the event. The first category addresses the why of the Holodomor, the second the how and the third deals with the consequences of the Holodomor. Thus, the proposed Holodomor Framework consists of three modules composed of: a) causal factors and historical processes; b) demographic description and analysis; c) consequences of the Holodomor.

   It is useful to elaborate first the second module before describing the whole Framework. The key variable of the second module is direct losses disaggregated by different geographic units, subpopulations and characteristics. Using the population reconstruction method and other demographic techniques, we calculated a detailed set of estimates of losses in Soviet Ukraine for different subpopulations and by different characteristics (Figure 3). Starting at the national level with estimates of losses by urban and rural areas, we estimated losses by oblasts and then by raion (Rudnydtskyi et al. 2015b; Wolowyna et al. 2016; Levchuk 2018a). In most of these cases we disaggregate these losses by year, sex and age. A second elaboration of losses is in terms of subpopulations like nationality. A third dimension is the analysis of the monthly dynamics of losses in 1933, as there was a sudden and steady increase in mortality during the first half of 1933 (Wheatcroft 1990; Kulchytskyi 2008; Wolowyna 2018).

Categories of Famine Losses		
Geography:	- Urban - rural areas	
	- Ukraine, oblasts, raions	

Characteristics:	- age and sex
	- nationalities
Monthly during first half of 1933	

Figure 3 Second module of the Framework

This detailed elaboration of losses by different subpopulations, categories and levels of geography has several benefits: a) it quantifies the effects of the Holodomor according to structural dimensions; b) provides a detailed picture of these effects at different geographical levels and for different subpopulations; c) allows for connections with historical factors and processes proposed as causes of the Holodomor. In the first case one structural dimension is geographic-administrative structure of the country; d) provides a platform for analyzing consequences of the Holodomor.

We start by estimating losses for urban and rural areas of the country. The estimations at the oblast level are based on the national estimates and are made consistent with national totals. The same applies to losses at the raion level. Estimation of losses for different subpopulation follows the same principle: a) losses as a lower level are based on losses at the previous higher level; b) losses at the lower level are adjusted to totals at the respective hither level.

This hierarchical approach to the estimation of losses is also consistent with statistical principles. In general, by using estimates at higher levels of aggregation to make estimates for lower level units we maximize the reliability of the lower level estimates. For example, estimates of losses by oblasts based on estimates for the whole country tend to be more reliable than independently derived estimates for each oblast.
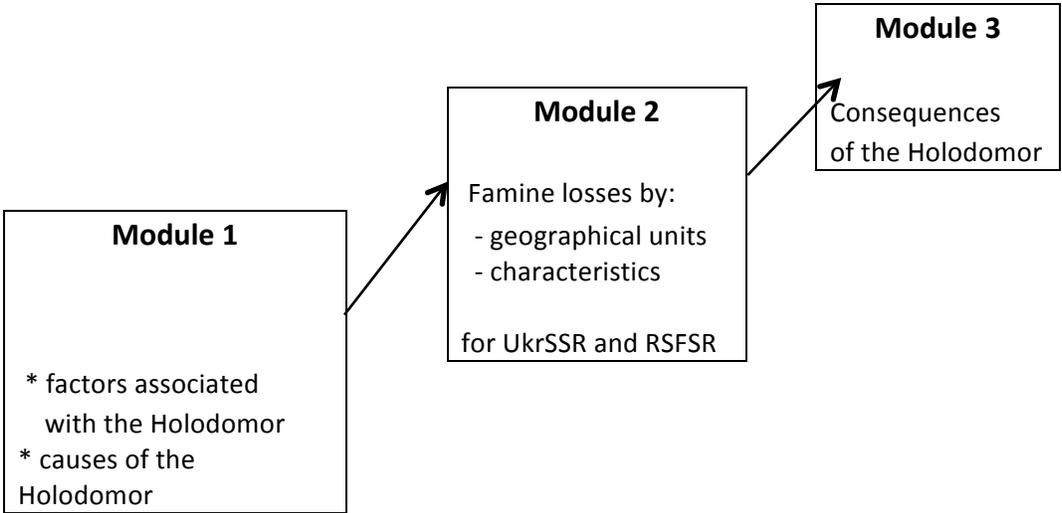.

Figure 4. Structure of the Holodomor Framework

The structure of the Framework is presented in Figure 4. Variables in module 1 are linked with variables in module 2, and variables in module 2 are linked with variables in module 3. All variables in the first module can be linked to relevant losses in the second module. Consequences of the Holodomor in the third module can be linked to respective losses in the second module. Thus, losses are dependent variables linked to causal variables as independent variables in the first module; variables measuring consequences of the Holodomor in the third module are dependent variables, with losses being the key independent variable.

A mathematical formulation of the Framework consists of two types of formulas:

Modules 2 and 1: f(losses) = (natural variables, political variables, controls)
Modules 2 and 3: f(consequences) = (losses, other variables)

There is an extensive literature on the causes of the Holodomor (Mace 1986; Conquest 1986; Viola 1996; Davies and Wheatcroft 2009; Martin 2001; Kulchytskyi 2007; Kondrashyn 2008, 2011; Graziosi 2005; Hrynevych 2008-2012; Shapoval 2007; Werth 2008). These causes or factors can be classified into two types: a) short- and long-term factors; b) natural and political factors.

Short-term factors refer to events in the late 1920s and early 1930s, while long-term factors take the causal antecedents to 1919. Among short-term factors related to the Holodomor researchers have analyzed collectivization, mismanagement related to collectivization, excessive grain requisitions, confiscation of food, climatic factors, closing of borders, measures to limit internal migration, "black boards", resistance and repressions, the "nationality" factor, selective distribution of food "assistance" in 1933, etc.

Graziosi (2005), Applebaum (2017) and others have formulated the hypothesis that the root causes of the Holodomor can be found in 1919. Peasant rebellions fighting grain requisitions and collectivization imposed by the Bolsheviks culminated in 1919. Although the Bolsheviks eventually defeated the Ukrainian government and occupied Ukraine, the memory of these rebellions and the threat of Ukrainian nationalism to the Soviet Union and the Communist movement were not forgotten by Stalin. According this hypothesis, these rebellions influenced Soviet policies in the 1920s and played a significant role in the 1932-1934 famine. As stated by Graziosi (2009, p. 8), "… in 1930 the Ukrainian GPU noted that the villages leading the resistance against collectivization were often the same that had distinguished themselves in 1905 or had produced before 1917 an abnormally high proportion of socialist cadres."

The classification of factors responsible for the Holodomor into natural and political is at the core of the ideological dispute among two major camps of scholars. These camps are characterized by two main perspectives on the 1932-1934 Famine, that have been labelled 'man-made on purpose' and 'man-made by accident' (Wheatcroft 2018). The fist perspective argues that after a generalized Famine during most of 1932, affecting different parts of the Soviet Union, the Famine became a weapon of terror towards the end of 1932 and during the first half of 1933, targeting Soviet Ukraine and Ukrainians in North Caucasus (Graziosi 2005; Kulchytskyi 2007; Applebaum 2017).

The second perspective relies mainly on economic factors like collectivization, excessive grain procurement targets, mismanagement, reckless ambitiousness and inexperience of Soviet leaders, with climatic factors playing a contributing role, as causes of the 1932-1933 famine (Kondrashin 2008, 2011; Davis and Wheatcroft 2009; Tauger 2001).

Graziosi (2005) labels these camps as A and B people. A people "… support the genocide thesis and see in the Famine an event artificially organized in order to: a) break the peasants and/or alter (destroy) the Ukrainian nation's social fabric, which obstructed the transformation of the USSR into a despotic regime". B people "…though fully recognizing the criminal nature of Stalin's policies, deem it necessary to study the Famine as a "complex phenomenon", in which many factors, from the geopolitical situation to the modernization effort, played a role alongside Moscow's intentions and decisions" (p. 68).

We use the Framework to illustrate how one can deal with these issues. First, we show examples of how the Framework provides tools for testing hypothesis about long-and short-term causes of the Holodomor, and then how we can address the natural vs. political causes of Holodomor controversy.

The Framework allows one to test hypothesis or statements based on different causes of the Holodomor using estimates of losses and maps of these losses at the oblast or raion levels. For example, one can infer from the long-term hypothesis that a map of raions by levels of peasant rebellions going back to 1917-1919 should be similar to a map depicting raions by levels of Holodomor losses in 1933. We already have a map of raions by level of losses in 1933 (Levchuk 2018a) but an equivalent map of peasant rebellions is not available, as the relevant data is quite limited so far. Data on peasant rebellions presented by Viola (1996) are for all of Ukraine; recent work by Krutsyk (2011) and Patryliak (2012) has produced some data at the subnational level but more work is needed. Such a map, together with the map of losses, could provide a test of this hypothesis.

Another example is our analysis of 1932-1934 rural losses by oblast. We show that different sets of economic and political factors explain some of the differences in levels of oblast losses (Wolowyna et al. 2016). Values of single factors do not seem to have high correlations with oblast or raion-level losses, and the same goes for respective maps. This indicates that an explanation of the Holodomor requires a multivariate approach, with losses as the dependent variable. An important contribution of the Framework is that loss estimates at the subnational level and/or by certain characteristics, provide dependent variables for testing different explanatory hypotheses about the Holodomor.

The 'man-made by accident' group of researchers of the Holodomor tends to focus on natural factors and ignores or downplays political factors, while the 'man-made on purpose' camp takes the opposite view. It is difficult to reconcile these two perspectives because often researchers start with ideologically preconceived positions. For example, Davis and Wheatcroft (2004, 2009) document extensively in their writings political factors with statistics and quotes from official documents, but when they summarize their position on the causes of the Holodomor they adopts the 'man-made by accident' position and ignore or reject the political factors they document in detail.

In a pioneering paper Graziosi (2005) points out two issues that may help find a unified explanation of the Holodomor. First, A people focus on UkrSSR and the Kuban okruh in North Caucasus while B people focus on the pan-Soviet famine. Second, it is important to separate the 1931-1932 'spontaneous' famines …from the post- September 1932 Famine, which took on such a terrible features not least because of human decisions." (Graziosi 2009, p.70).

We have followed up on both of these suggestions and, in addition to estimates of losses in UkrSSR, we have estimated losses for all Soviet Republics and regions of RSFSR. This requires adding to module 2 of the Framework losses for regions of RSFSR similar to losses for UkrSSR (Figure 4).

The Framework also suggests a strategy for dealing with the natural vs. political factors controversy. The strategy consists in: a) comparing losses of oblasts in UkrSSR with losses of regions in RSFSR and proposing explanations for the higher losses in Soviet Ukraine than in RSFSR; b) comparing losses of Ukrainians with losses of other minorities in UkrSSR and explaining why Ukrainian's have higher losses than all the other nationalities. 'Natural' variables like collectivization, mismanagement, grain requisition and weather are present in regions of both countries, but political factors like resistance and repressions, closing of borders

and searches for grain with food confiscation are absent or less intensive in many regions of RSFSR (Levchuk et al. 2018b).

Another example is the surge in rural mortality during the first half of 1933. A detailed analysis of monthly rural relative losses during the first half of 1933 shows that in all oblasts of Ukraine and in some regions of RSFSR there was a sudden and sustained increase in these losses. However, rates of increase of these losses varied extensively among regions. In all of these cases there were natural factors present, but in some regions of RSFSR there were no political factors present. We show that the presence of political factors is directly related to the slope of the relative losses, i.e., the presence and intensity of political factors is positively correlated with higher slopes (Wolowyna 2018).

The second module of the Framework provides a platform for exploring consequences of the Holodomor. Several disciplines have proposed hypothesis about long-term consequences of extreme famine. One example is the hypothesis that exposure to extreme famine during pregnancy increases the probability of occurrence of diabetes type 2 later in life. Based on preliminary estimates of 1933 losses for several regions of Ukraine, Lumey et al (2015) have provided statistical evidence for this hypothesis. Using our more precise estimates of losses at the raion level for the whole country Lumey (2018) proposes to verify and extend this study.
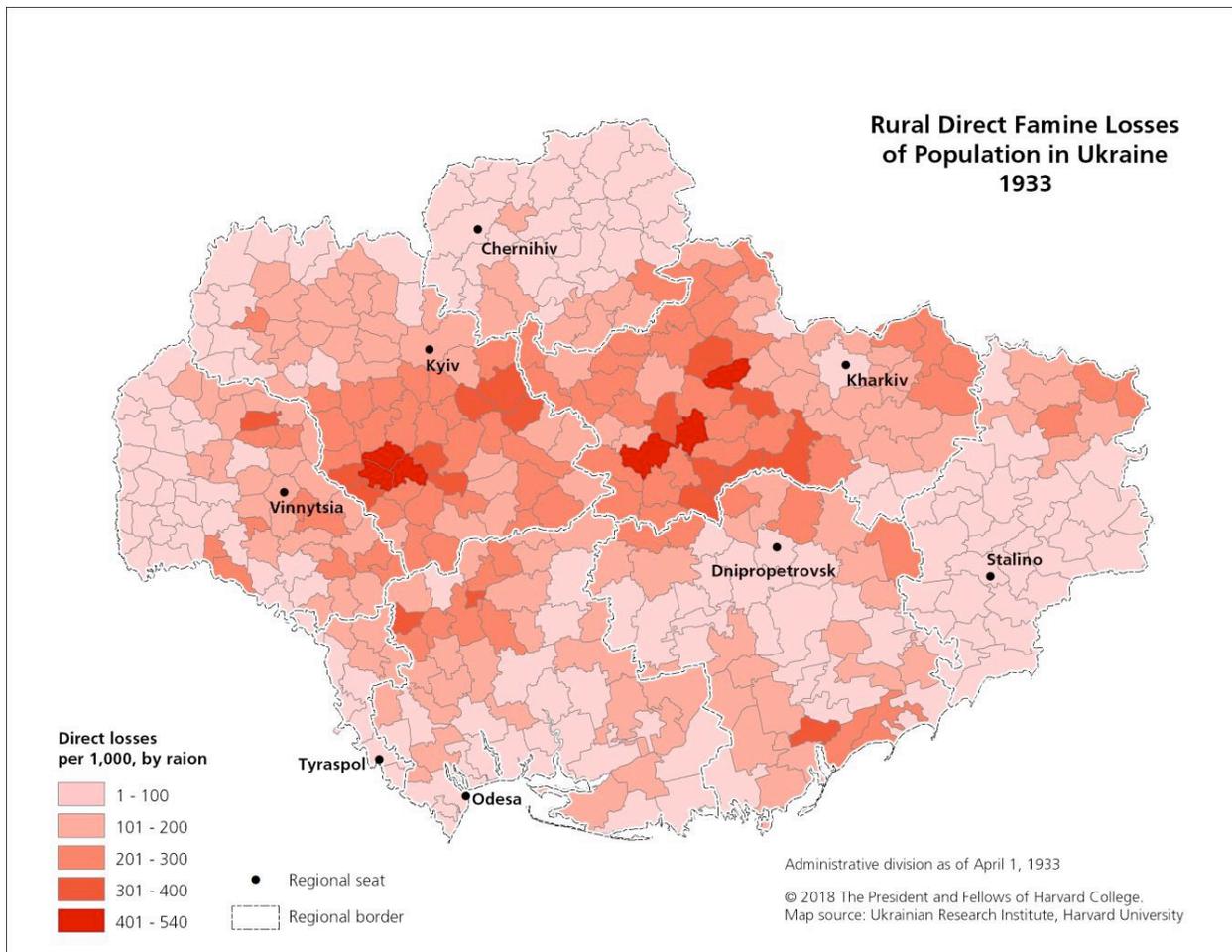
Political scientists have shown that States use repression to enforce obedience, and that repression – especially if it is violent, massive and indiscriminate – often incites opposition. Using our estimates of Holodomor losses at the raion level as an indicator of mass repression, Rozenas and Zhukov (2018) have linked this data with voting behavior in Soviet Ukraine and independent Ukraine to test these apparently contradictory hypotheses.

Losses at the oblast and raion levels in Module 2 provide the basis for exploring a variety of consequences of the Holodomor. An important hypothesis currently explored by researchers is the breakdown of traditional Ukrainian rural way of life, traditions and culture (Noll 1999). Stasiuk (2008) suggests that:

> "Collectivization and the Holodomor of 1932–33 also led to another negative change: the destruction of the family. First of all, an immense number of families were broken up. Some family members who were deported left behind small children and elderly relatives unable to work and fend for themselves. Thus, one more family tradition that had existed prior to collectivization and the Holodomor was disappearing: care for the elderly. Second, able-bodied men and women left their families to search for food" (p. 10).

More generally "In the late 1920s and early 1930s, Ukraine's rural regions were rendered so lifeless, both physically and morally, that they were powerless to mount resistance. The entire value system of the Ukrainian people was deformed, and age-old customs and traditions were eliminated by force" (Stasiuk 2008, p. 13).

Some researchers have suggested that the Holodomor was instrumental in the development of a Russified, post-Soviet society in the region of Donbas in Eastern Ukraine, with district social and psychological characteristics. Some go as far as suggesting that the root cause of the current war in Eastern Ukraine can be traced to the consequences of the Holodomor. (Horyn 2015; Sobol 2003). As can be seen in the Map, raions with the highest rural losses in 1933 are in the Southern and central parts of Kyiv and Kharkiv oblasts, not in the Donbas area. The Framework provides the means to verify these hypotheses and, based on our estimates of 1933 losses at the rarion level, it is quite possible that they may have to be modified.

Rural Direct Famine Losses of Population in Ukraine 1933

Direct losses per 1,000, by raion
- 1 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 540

Regional seat
Regional border

Administrative division as of April 1, 1933

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Map source: Ukrainian Research Institute, Harvard University

   The Framework provides a structured way of testing these hypotheses. Such tests would consist of the following steps: a) develop quantifiable proxies of the variables related to these hypotheses; b) collect data for these proxies; c) test relationships of Holodomor losses at the subnational level with the hypothesized consequences of the Holodomor.

Interdisciplinary approach to Holodomor research

   When we started our research on the demography of Holodomor, we soon realized that it was impossible to understand the demography of the Holodomor without the help from other disciplines, especially history. First, a review of the literature revealed that a large proportion of Holodomor research was done by historians. Second, many historians attempted to do demographic analysis of the Holodomor with varying degrees of success. Third, part of demographic research of the Holodomor relies on historical research. Fourth, in some cases it is difficult to understand demographic results without historical input. For all these reasons, in order to do a better job on the demographic perspective of the Holodomor, it is important to have input from historians. We started a formal collaboration with historians, have two published articles with historians as collaborators (Wolowyna et al. 2016; Levchuk et al. 2015) and are working on other collaborative articles.

   This strategy is not without its difficulties. Each discipline has its own modus operandi, methods, vocabulary, standards, and sometimes it is not easy to find common ground and

communicate effectively. However, our experience shows that the advantages outweigh the disadvantages. We first summarize the advantages of a combined demography-history research approach and then provide some specific examples where this strategy produced important results.

Contributions of demography to history
 * Evaluate historical statements or hypothesis: higher Holodomor losses are expected in the grain-growing regions of Soviet Ukraine.
 * Suggest research questions for historians: why non-grain growing regions in UkrSSR experienced higher losses than grain-growing regions.
* Provide quantitative tools that refine or disprove historical statements: need to complement absolute numbers of losses with relative losses (standardized by population), especially for comparative research.
 * Confirm quantitatively historical statements: Ukrainians experienced higher Holodomor losses than other nationalities in Soviet Ukraine.
 * Clarify key concepts, like the difference between death certificates and aggregated reports of registered deaths.

Contributions of history to demography:
 * Provide explanations of demographic results: help explain diversity of raion-level losses.
 * Suggest hypothesis or problems for demographic research: quantify in terms of losses the relationship between industrial structure of cities and systems of food rations.
 * Provide official archive documents in support of demographic analysis: document peasant rebellions, in order to test their relationship with raion-level losses in 1933.

Debunking Soviet and Russian disinformation and historical "facts":
* The 1932-1933 Famine affected the whole Soviet Union and everybody suffered:
a) Our estimates of losses by Soviet Republics showed large variation in the level of losses among the different Soviet Republics, from 0.6 percent of the total 1933 population for the Transcaucasus Republics (Georgia, Armenia and Azerbaijan) to at least 23 percent for Kazakhstan (Rudnytskyi et al. 2015).
b) We have also shown that all parts of Soviet Ukraine were seriously affected by the Famine, albeit at different levels, but only a limited number of regions in RSFSR were significantly affected by the Famine (Wolowyna et al. 2016; Levchuk et al. 2018b).

 * It is impossible to estimate exactly the number of Holodomor losses due to incomplete and unreliable data:
This is incorrect for several reasons: a) we have managed to collect almost 100 percent of all the demographic data needed to estimate Holodomor losses, and have all the necessary elements to make estimates of losses based on the most accurate methodology, i.e., population reconstruction; b) it was recognized in the Soviet Union that the UkrSSR had the best demographic data among all Soviet Republics in the 1920s and early 1930s; c) although some of the demographic data was falsified (the 1939 census, for example), many of the demographic data were of good quality. Some of the errors were not intentional but due to normal problems in demographic data, like under registration of births and deaths in years outside the Holodomor period (1932-1934) and under-counts in the 1926 and 1937 censuses.

Our estimate of 3.9 million direct losses for Soviet Ukraine is not perfect. The near completeness of the data used, careful evaluation of the quality of the data and their adjustment where warranted, combined with the methodology of population reconstruction, allow us to state with high probability that this estimate is within a +/- 10 percent of margin of error.

 * Holodomor affected almost exclusively rural areas:
  Although the bulk of Holodomor losses occurred in rural areas, urban areas were also affected by the Famine. Of the 3.9 million of total losses, almost 400 thousand were urban losses, equivalent to four percent of the 1933 urban population. Large segments of the urban population had no food rations and were at risk of starvation similar to that of many rural inhabitants.

 * Ukrainians were the main target of the Holodomor:
  Our estimates of losses by nationality indicate that this statement is not totally accurate. Overall, 1933 losses for Ukrainians in rural areas were twice as high as losses for all the other nationalities combined, but other nationalities were also affected by the Holodomor. In terms of percent of 1933 relative rural populations, losses for Ukrainian were 16 percent, Poles 9 percent, Russian 8 percent, German 7 percent and Jews 4 percent. Thus, all nationalities living in rural Ukraine were affected by the Holodomor but Ukrainians suffered the most. Now we are working with historians to try to explain these differences.
  This is a first attempt to provide a formal structure for Holodomor research. A key characteristic is an interdisciplinary approach. Although history is the obvious candidate for a close collaboration, examples from other disciplines show that this framework would profit from a more generalized formulation that encompasses other disciplines.

Notes

[1] As an example, Kulchytskyi's quote about a "Ukrainian" Holodomor implies that there is more than one Holodomor. A second example is the decree by President Kuchma designating the fourth Saturday of November as a day to commemorate "the victims of the *Holodomors* and political repression."

[2] Two types of famine-related losses have been proposed by demographers, direct and indirect.

[3] We have shown that there were also Holodomor losses in 1934.

[4] A more comprehensive model should also consider indirect losses but this will be dealt with at a later stage.

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