Context and Background

This paper offers insight into the direct and reverberating effects of the violence in Eastern Ukraine on healthcare systems and patient outcome. It is based on a report undertaken by the Deputy Chief of Healthcare Statistics in the Donbas Region, Dr. L. O. Polyanska.

Key findings

Some key findings of the report show that:

- Mortality rates in the Donetsk region, outstrip the birth rates. In 2016, the birth-rate stood at 7.05 per 1,000 people; mortality rates were at 16.4 per 1,000 people. The areas worst impacted have seen the fiercest fighting.
- The number of full-time staff positions of doctors in the Donetsk region between 2012 and 2016 decreased by 7.2%. The most significant decreases were observed in territories that witnessed the fiercest fighting, namely: Avdiivka (23.2% decrease); Marinka (15.1%); and Yasynuvata (14.5%).
- The numbers of doctors per 10,000 in the Donetsk region fell by 8.8. There was also a decline in doctors with specialisms, especially amongst paediatric surgeons.
- As of 2016, there were no pulmonologists, urologists, neurosurgeons with a paediatric specialism across the entire region at all, with but a few specialists in paediatric haematology and gastroenterology.
- The provision of beds decreased by 14.1%. At the same time many specialised wards were closed down. The most significant decrease in the provision of beds was that of specialized beds for children.
- The reduction is both medical specialists and in beds, may have helped fuel the rise in hospital mortality rates, which increased 10.5% between 2012 and 2016.

The report findings are examined in more detail below.

Historical overview of Ukraine

Ukraine gained its independence after the Soviet Union collapsed in 1991. Since that time, this eastern European nation has been torn between closer integration with Western Europe, and close alignment with its old ally, Russia. The Kremlin sees its interests in the country threatened by Western influence in Ukraine, a land that gets its name from the word 'borderland'.

Today, Ukraine is Europe’s second largest country and is dominated by agricultural plains, renowned for their thick, black earth. To the east lie large pockets of heavy industry and mining communities. Such lands possess valuable resources so great that Ukraine has been repeatedly invaded for its wealth: this includes invasions by the Byzantines, Poles, Hungarians, Mongols, Lithuanians, Ottomans, Moldovans, Russians, Danes, Norwegians, British, Czechs, Germans, Swedes and Greeks – among others.

Today, while Ukraine and Russia share common historical origins, the west of the country has far closer ties with its European neighbours, particularly Poland, and nationalist sentiment is strongest there. A significant minority of the population uses Russian as its first language, particularly in the cities and the industrialised east.
An uprising against pro-Russian President Viktor Yanukovych in 2014 ushered in a Western-leaning government, but Russia used the opportunity to seize the Crimean Peninsula, and arm insurgent groups to occupy parts of the industrialised east of Ukraine. More than 13,000 people have been killed in the ensuing conflict in Donetsk and Luhansk regions.

This report looks at how that conflict impacted health care systems and outcomes across the Donetsk region.

**Geographical region**

The Donetsk region lies to the south-east of Ukraine, sitting between the Donetsk Ridge, the Azov highlands and, in part, the Dnipro lowlands. There, the length of the roads from the North to the South stretch some 347 km, and from East to West some 147 km. In total, the region covers some 26,517 km$^2$, of which 28% (or 7,500 km$^2$) are ‘occupied territories’, over which Ukraine has no control.

Within this space lives a population, as of 1 January 2017, of 1,946,000. The population density sits at 102 inhabitants per km$^2$. In total, the region controlled by the government consists of 15 urban conurbations and 12 rural administrative districts. The seaport at Mariupol provides access to the Black and Mediterranean seas.

The Donetsk region borders the most densely populated and economically developed regions of Ukraine – Dnipropetrovsk, Kharkiv, Zaporizhia and Luhansk – as well as, today, sharing a border, or line of contact, with the non-government-controlled areas of the so-called Donetsk People’s Republic.

Environmentally, the region has significant issues with pollution, driven by a national programme weighted towards exploiting the raw materials of the region. As such, much focus is on the energy, metallurgical and chemical industries, with respective environmental damage ensuing. A lack of legal mechanisms and economic incentives for environmental protection, along with ineffective protection measures and a low level of environmental awareness amongst locals, means that pollution and other environmental hazards are of significance in the Donetsk region.

**Demographics**

The total population of Donetsk region is estimated to stand at 1,946,000 people. Of these, 1,665,943 (86%) are urban residents, whereas 280,057 (14%) live in rural areas and villages. Recent years has witnessed a decline in population levels in both the Donetsk region and in Ukraine as a whole. In the region, according to data from 2016, the birth-rate stood at 7.05 per 1,000 people; mortality rates were at 16.4 per 1,000 people.

Population decline differs according from administrative unit to administrative unit, in varying forms of intensity (Figure 1). Most notably, the areas in red are areas which witnessed the fiercest fighting.
It should be noted that significant changes in population levels in some districts are due to that fact that some territories were divided by the conflict (for instance, Slovyansk – Slovyansk district and Bakhmut – Bakhmut district). Other districts are impacted by the merging of settlements, with some districts whose administrative centres were once located in non-government-controlled areas, being subsumed by other districts, inside Ukraine.

Despite these caveats, the population level of Kostiantynivka city has seen significant decline. In 2016, the numbers stood at 7.5% less than they had done in 2012. Toretsk, too, saw a decrease in population levels by some 6.5% over the same period. Kostiantynivka and Vuhledar saw a decrease in 5.0% and 4.9% respectively.

Some of these changes are because of different birth and death rates – the natural shift of population levels, such as in Kostiantynivka, Toretsk, Liman, Pokrovsk and Kostiantynivka (Figure 2). It is clear from this graph that the mortality rate is out-stripping the birth rate in every part of eastern Ukraine.
The significant drop in Vuhledar’s population is largely due to migration.

Evidence of a declining population due to ageing is seen in the fact that people of 35 and older make up 61.5% of the total population. Furthermore, this ageing population is weighted towards women. The gender ratio of the Donetsk region is 1 man to every 1.2 women, with women making up 54% of the population.

The demographics of the region, when examined by age, also reveals age and gender weightings. The largest male age category is between 30 and 34 years. At the same time, the largest female age grouping belongs to those between 55 and 59. The decrease in men compared to women between the ages of 50 and 54 and between 55 and 59 is likely due to the deaths incurred during the armed conflict in Afghanistan (in 1979, men in these age categories were 18-22 and 23-27 respectively).

In addition, there is a notable spike, in both sexes, between 5 and 9 years. This is probably a consequence of the government childbirth payments that were introduced in April 2005. However, on the whole, the age demographics of the Donetsk region is clearly weighted towards the old (Figure 3).
It is clear from the data that the description of the conflict as 'the oldest war in the world' reflects a region where the old outnumber the young. The proportion of people 60 years old and over makes up a quarter of the total population (Figure 4).

When comparing mortality rates within those 50 years and older in the Donetsk region, the greatest influence of age impacting mortality rates is found in Liman, Dobropillya, Velika Novosilka, Oleksandrivka and Novohrodivka. At the same time, the impact of age on mortality rates is lower in Yasynuvata, Bakhmut, Vuhledar, Avdiivka and Mariupol – areas which saw the widespread use of explosive violence (Figure 5).
Network of medical institutions

There are 21 medical institutions in Donetsk region operating in the non-government-controlled area. These include: Regional Clinical Territorial Medical Organization, Regional Children’s Clinical Hospital, Regional Hospital for Occupational Diseases, Donetsk Regional Anti-tumoral Centre, Regional Narcological Dispensary, Donetsk Regional Blood Transfusion Station, Regional Tuberculosis Dispensary, Regional Endocrinological Dispensary, Regional Dermato-venerologic Dispensary and the Regional Diagnosis Centre etc.

Notwithstanding these, there are currently 155 healthcare facilities in the region (Table 1):

Table 1: Healthcare facilities in the Donetsk region

<table>
<thead>
<tr>
<th>Name of institution</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Children’s Home</td>
<td>2</td>
</tr>
<tr>
<td>Regional Centre (bureau) of medical and social assessment</td>
<td>1</td>
</tr>
<tr>
<td>Bureau of Forensic Medicine (Regional)</td>
<td>1</td>
</tr>
<tr>
<td>Hospital for war veterans</td>
<td>1</td>
</tr>
<tr>
<td>Children’s Municipal Hospital</td>
<td>3</td>
</tr>
<tr>
<td>Infectious Diseases Hospital (Including Children’s Hospital)</td>
<td>2</td>
</tr>
<tr>
<td>Information Analysis: Centre for Health Statistics</td>
<td>2</td>
</tr>
<tr>
<td>Clinic at Slovyansk Railway Terminal</td>
<td>1</td>
</tr>
</tbody>
</table>