COVID-19 в цифрах.

Ниже представлен небльшой анализ по заболеваемости, смертности и выздовавливаемости, а так же наглядная визуализация данных. Скучный код можно пропускать.

Данные взяты с Kaggle (https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset#2019_nCoV_data.csv), так же можно просматривать данные на странице GitHub (https://github.com/CSSEGISandData/COVID-19).

In [149]:
```
import numpy as np
import pandas as pd
import matplotlib as mpl
import matplotlib.pyplot as plt
import seaborn as sns
```

Данные хранятся в одной таблице для удобства:

- `Country/Region` -- страна.
- `Last Update` -- дата обновления.
- `Confirmed` -- подтверждение случаев.
- `Deaths` -- смертей.
- `Recovered` -- выздоровевших.

In [221]:
```
data = pd.read_csv('covid_19_data.csv')

data.head()
```

Out[221]:

	SNo	ObservationDate	Province/State	Country/Region	Last Update	Confirmed	Deaths	Recove
0	1	01/22/2020	Anhui	Mainland China	1/22/2020 17:00	1.0	0.0	
1	2	01/22/2020	Beijing	Mainland China	1/22/2020 17:00	14.0	0.0	
2	3	01/22/2020	Chongqing	Mainland China	1/22/2020 17:00	6.0	0.0	
3	4	01/22/2020	Fujian	Mainland China	1/22/2020 17:00	1.0	0.0	
4	5	01/22/2020	Gansu	Mainland China	1/22/2020 17:00	0.0	0.0	

Посчитаем в скольки сранах однаружен коронавирус на данный момент:

In [223]:
```
data.loc[data['Country/Region'] == 'Mainland China', 'Country/Region'] =

country_list = data['Country/Region'].unique()

print('Коронавирус обнаужен в {} странах:'.format(country_list.size))

for county in sorted(country_list):
    print('- {}'.format(county))
```

```
Коронавирус обнаужен в 222 странах:
-  Azerbaijan
- ('St. Martin',)
- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda
- Argentina
- Armenia
- Aruba
- Australia
- Austria
- Azerbaijan
- Bahamas
- Bahamas, The
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bhutan
- Bolivia
- Bosnia and Herzegovina
- Botswana
- Brazil
- Brunei
- Bulgaria
- Burkina Faso
- Burma
- Burundi
- Cabo Verde
- Cambodia
- Cameroon
- Canada
- Cape Verde
- Cayman Islands
- Central African Republic
- Chad
- Channel Islands
- Chile
- China
- Colombia
- Comoros
```

- Congo (Brazzaville)
- Congo (Kinshasa)
- Costa Rica
- Croatia
- Cuba
- Curacao
- Cyprus
- Czech Republic
- Denmark
- Diamond Princess
- Djibouti
- Dominica
- Dominican Republic
- East Timor
- Ecuador
- Egypt
- El Salvador
- Equatorial Guinea
- Eritrea
- Estonia
- Eswatini
- Ethiopia
- Faroe Islands
- Fiji
- Finland
- France
- French Guiana
- Gabon
- Gambia
- Gambia, The
- Georgia
- Germany
- Ghana
- Gibraltar
- Greece
- Greenland
- Grenada
- Guadeloupe
- Guam
- Guatemala
- Guernsey
- Guinea
- Guinea-Bissau
- Guyana
- Haiti
- Holy See
- Honduras
- Hong Kong
- Hungary
- Iceland
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Israel
- Italy

```
- Ivory Coast
- Jamaica
- Japan
- Jersey
- Jordan
- Kazakhstan
- Kenya
- Kosovo
- Kuwait
- Kyrgyzstan
- Laos
- Latvia
- Lebanon
- Liberia
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- MS Zaandam
- Macau
- Madagascar
- Malawi
- Malaysia
- Maldives
- Mali
- Malta
- Martinique
- Mauritania
- Mauritius
- Mayotte
- Mexico
- Moldova
- Monaco
- Mongolia
- Montenegro
- Morocco
- Mozambique
- Namibia
- Nepal
- Netherlands
- New Zealand
- Nicaragua
- Niger
- Nigeria
- North Ireland
- North Macedonia
- Norway
- Oman
- Others
- Pakistan
- Palestine
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Poland
```

- Portugal
- Puerto Rico
- Qatar
- Republic of Ireland
- Republic of the Congo
- Reunion
- Romania
- Russia
- Rwanda
- Saint Barthelemy
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and the Grenadines
- San Marino
- Sao Tome and Principe
- Saudi Arabia
- Senegal
- Serbia
- Seychelles
- Sierra Leone
- Singapore
- Slovakia
- Slovenia
- Somalia
- South Africa
- South Korea
- South Sudan
- Spain
- Sri Lanka
- St. Martin
- Sudan
- Suriname
- Sweden
- Switzerland
- Syria
- Taiwan
- Tajikistan
- Tanzania
- Thailand
- The Bahamas
- The Gambia
- Timor-Leste
- Togo
- Trinidad and Tobago
- Tunisia
- Turkey
- UK
- US
- Uganda
- Ukraine
- United Arab Emirates
- Uruguay
- Uzbekistan
- Vatican City
- Venezuela
- Vietnam
- West Bank and Gaza

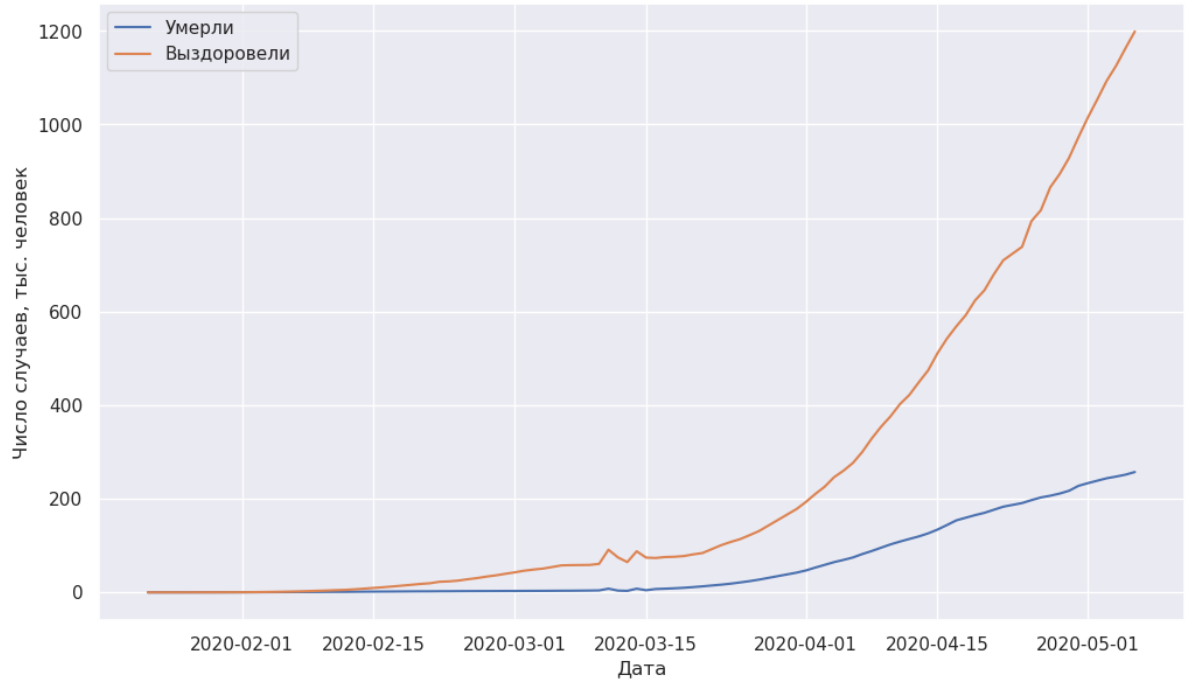
```
- Western Sahara
- Yemen
- Zambia
- Zimbabwe
- occupied Palestinian territory
```

In [226]:
```
data['Last Update'] = pd.to_datetime(data['Last Update'])
data['Date_date'] = data['Last Update'].apply(lambda x:x.date())
df_by_date=data.groupby(['Date_date']).sum().reset_index(drop=None)

# there is smt strange
df_by_date = df_by_date.loc[df_by_date['Confirmed'] != 2614186.0]
```

Выведем графики заболеваемости и выздоравливаемости.

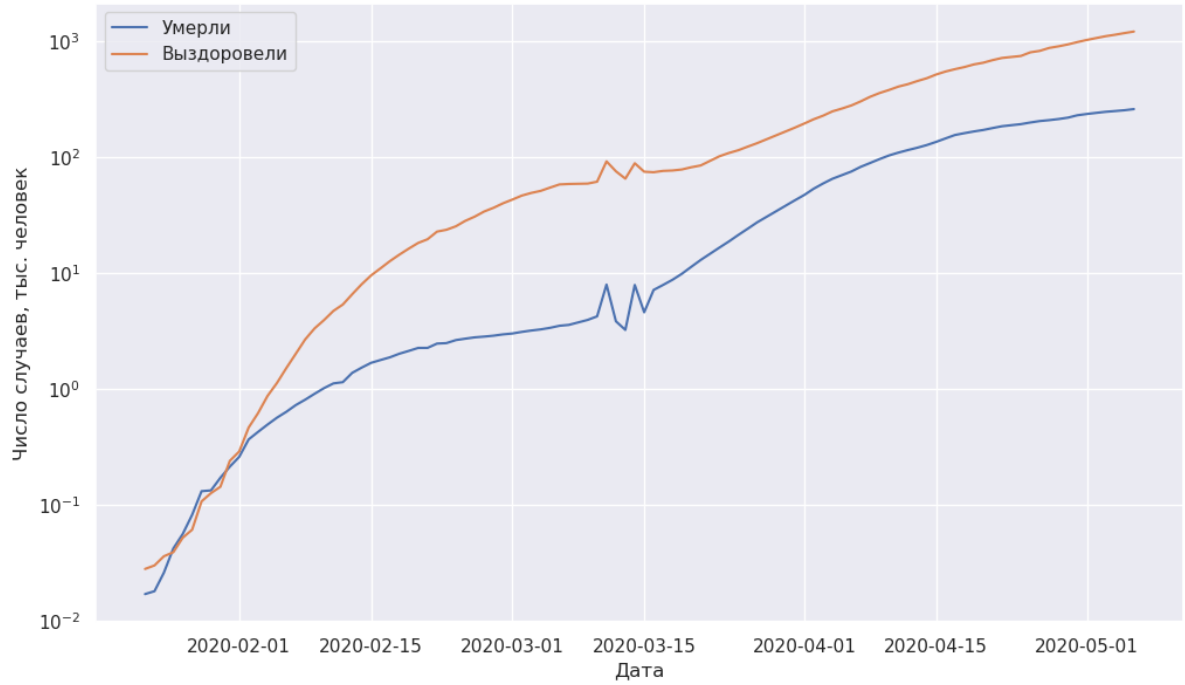
Данные в сумме по миру.

In [232]:
```
mpl.rcParams['figure.figsize'] = [12.0, 7.0]
mpl.rcParams['figure.dpi'] = 100

sns.set()

d = {"Deaths":"Умерли", "Recovered":"Выздоровели"}

for label in d:
    plt.plot(df_by_date["Date_date"],
             df_by_date[label]/1000,
             label=d[label])

plt.xlabel('Дата')
plt.ylabel('Число случаев, тыс. человек')
plt.legend()
plt.show()
```



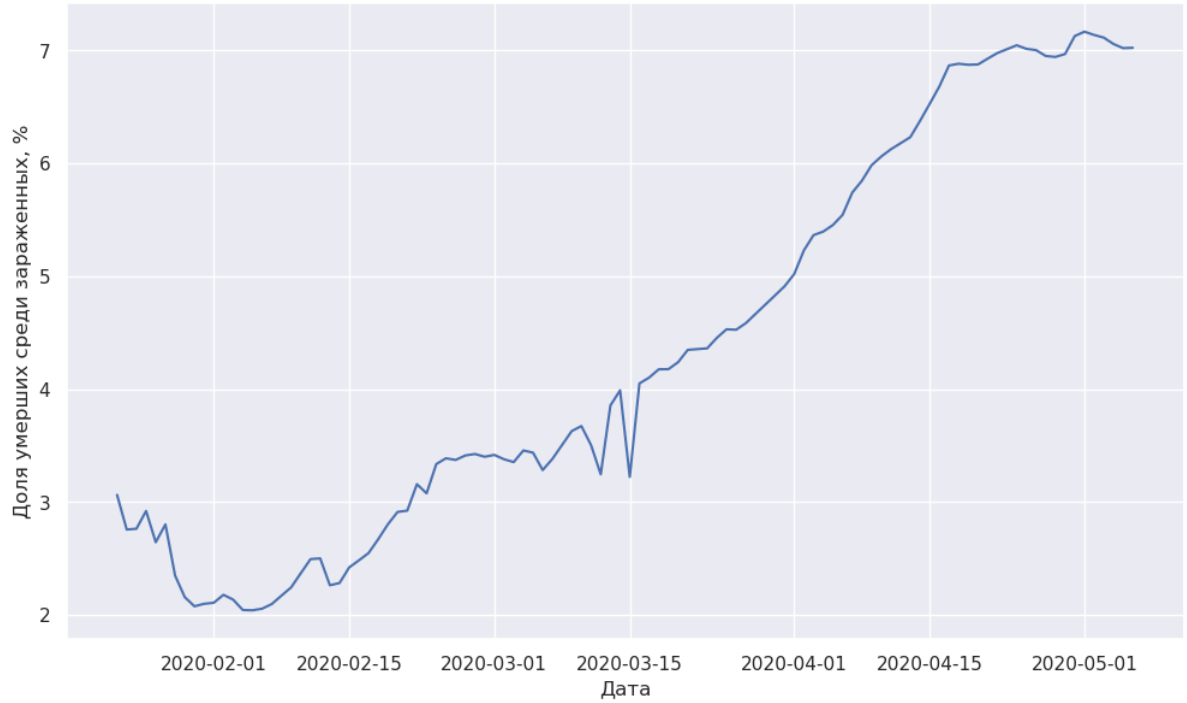
Смертность и количество выздоровевших людей.

In [231]:
```
plt.yscale('log')
for label in d:
    plt.plot(df_by_date["Date_date"],
             df_by_date[label]/1000,
             label=d[label])

plt.ylabel('Число случаев, тыс. человек')
plt.xlabel('Дата')
plt.legend()
plt.show()
```



Грубая оценка летальности:

In [217]:
```
plt.plot(df_by_date["Date_date"],
         df_by_date['Deaths']/df_by_date['Confirmed']*100)

plt.ylabel('Доля умерших среди зараженных, %')
plt.xlabel('Дата')
plt.show()
```



Динамика выздоровления:

In [218]:
```
for label in d:
    plt.plot(df_by_date["Date_date"],
             df_by_date[label]/df_by_date['Confirmed']*100,
             label=d[label])

plt.ylabel('Доли умерших и выздоровевших зараженных, %')
plt.xlabel('Дата')
plt.legend()
plt.show()
```