

Economic Burden of Influenza in Kyrgyzstan, Micro-Level Cost Data Collection and Survey Methodology within the Context of COVID-19



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## Influenza – A public health problem

Widespread transmission every year + potential for global pandemics

Certain high-risk groups can develop severe complications of influenza virus infection

### Substantial economic impact

Millions of medical visits; lost work/school days

Can overwhelm medical care systems during epidemics and pandemics

Vaccines are safe and effective, but need to be given annually

Seasonal influenza deaths over the past 100 years likely to exceed deaths due to influenza pandemics\*

\* GBD 2017 Influenza Collaborators, Lancet Resp Med 2019



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## Global burden of influenza

- 290,000 – 650,000 deaths each year (most in countries with little or no vaccination program)<sup>1</sup>
- 10% of pediatric respiratory hospitalizations<sup>2</sup>
- Estimated ALRI episodes by pathogen each year for children aged <5 years
  - RSV = 34 million<sup>3</sup>
  - Influenza = 20 million<sup>3</sup>
  - *S. pneumoniae* = 14 million<sup>4</sup>

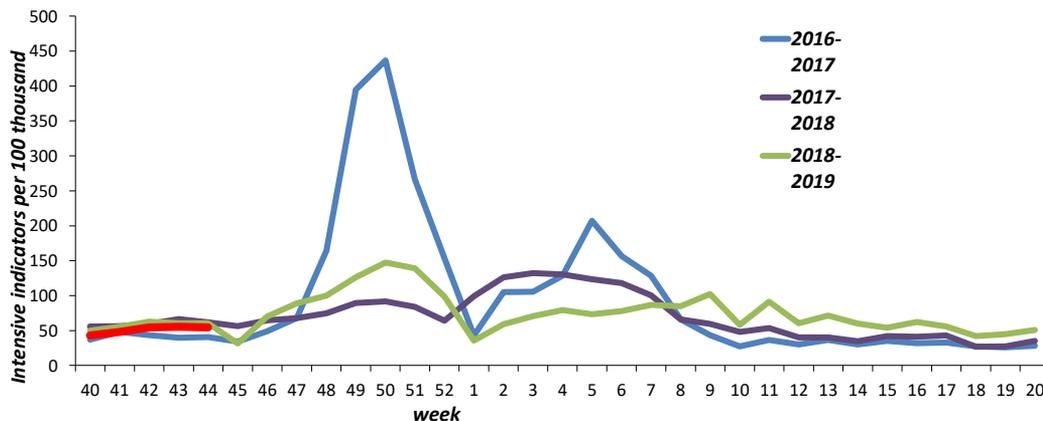
<sup>1</sup>Iuliano D et al Lancet 2017 <sup>2</sup>Lafond K et al PLOSMed 2016 <sup>3</sup>Nair H et al Lancet 2010 <sup>4</sup>Watt J et al Lancet 2009



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## Influenza in Kyrgyzstan

Weekly Incidence of Influenza and SARI  
in the Kyrgyz Republic for 2016-2017; 2017-2018; 2018-2019  
Epidemiological Season



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# Influenza in Kyrgyzstan

## High Risk Groups:

- Health Workers
- Pregnant Women
- People with Chronic Diseases
- Children at the age 6 months to 5 years including with poor immunity
- Seniors at 65 years old and above



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# Influenza in Kyrgyzstan

## Sentinel Epidemiological Surveillance for Influenza like Diseases (ILI) and Severe Acute Respiratory Infections (SARI) in the Kyrgyz Republic 2008-2019



Sentinel Surveillance are carried out in 3 cities: Bishkek, Osh, Tokmok in 4- Family Medicine Centers, And for SARI – in 5 hospitals with involvement the territorial Epidemiological Centers  
Data are summarized, analyzed in the DDCSED

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## Influenza in Kyrgyzstan

### Seasonal Influenza Vaccination Prevention in the Kyrgyz Republic from 2013 to 2019

Years	Ministry of Health	The Task Force for Global Health	Total	Coverage %
2013-2014	6,000 (Grippol Plus)		6,000	0.9
2014-2015	25,184		25,184	3.9
2015-2016	24,150		24,150	3,7
2016-2017	69,645		69,645	10.7
2017-2018	84,642	105,000 (Agriflu)	189,642	29,2
2018-2019	91,500	70,000 (GC)	161,500	23,2
2019-2020	150,534		150,534	23,2
2020-2021	800,000	70,000	870,000	46

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## PIVI Approach and Partnership in Kyrgyzstan

### Partnership for Influenza Vaccine Introduction (PIVI)

Innovative public/private partnership between Ministries of Health, corporate partners, and technical agencies to:

Create sustainable, routine, seasonal influenza vaccination programs in LMICs

Build the immunization infrastructure, capacity and vaccine delivery systems required for future influenza pandemics and other infectious disease epidemics

Generate and share knowledge from country vaccination experiences with other countries and stakeholders



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## PIVI Approach and Partnership in Kyrgyzstan

The CDC and Task Force for Global Health (TFGH) coordinate the program and work with partners to accomplish the following:

- Pandemic preparedness (helping countries develop Seasonal Influenza systems)
- Strengthen global security as countries establish and regularly test the vaccine systems
- Supporting surveillance of influenza (and capacity building of local epidemiologists)
- Vaccine development and accessibility
- Roadmaps for sustainability planning for vaccines



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## Influenza and COVID-19

While the COVID-19 pandemic is not an influenza pandemic, influenza systems are being utilized in COVID-19 response around the world.

- Uniquely positioned to help countries respond to pandemic/epidemic threats
- WHO influenza surveillance and data sharing systems are being utilized to detect and diagnose cases of the virus and enable rapid sharing of the first genetic sequence data for the novel coronavirus from China
- Through PIVI, influenza vaccination programs are a key tool for prevention
- Task Force for Global Health (TFGH) programs have pivoted to respond to the current impacts of COVID-19, strengthen systems for the future, and restart disease control and elimination efforts.

## Influenza and COVID-19

Bilateral technical assistance to LMICs to prepare Ministries of Health for the deployment of COVID-19 vaccines and strengthen systems to implement, monitor, and evaluate immunization campaigns.

- United States Centers for Disease Control & Prevention's (CDC) COVID-19 Vaccine Task Force Global Team
- CDC's Global Immunization Division
- CDC's Influenza Division
- Task Force for Global Health

CDC is setting up calls with select countries over the next few weeks to discuss current COVID-19 vaccine planning landscape and interest in CDC support.

## Study on the Economic Burden of Influenza (COVID-19 Challenges)

According to official statistics in 2018, 74.6% out of all infectious and parasitic cases are attributed to acute respiratory viral infections and influenza

Until now, the economic burden has not been determined

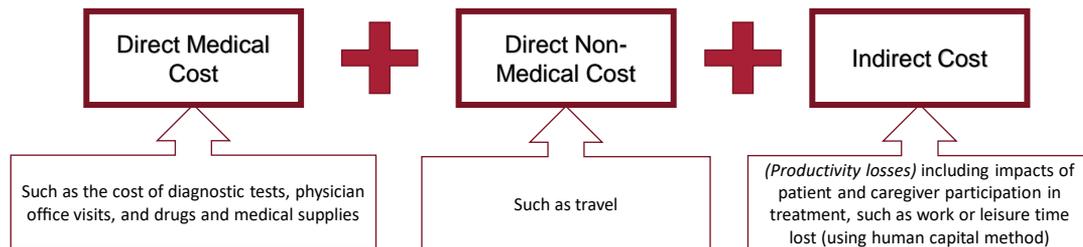
Due to the obvious significance of influenza in Kyrgyzstan, we are conducting a study on the Economic Burden of Influenza

## Study Aims/Objectives

To determine the **Economic Burden of Influenza** from a sample of patients with severe acute respiratory infections and influenza like illnesses who come to the sentinel health organizations.

- To explore the cost of illness from a societal perspective
- To compare the costs of illness across different levels of severity of illness
- To provide evidence to government treatment estimates (and the factors influencing them), sustainability plans, procurement plans, and multi-year plans

What is Economic Burden of Influenza?



## Study Methods

Prospective cohort method among patients who seek medical assistance from participating health organizations

- Facility sample (9 sentinel surveillance sites in Bishkek, Osh, and Tokmok)
- Patient sample

Methodological Issue	Specification
<b>Influenza burden</b>	Laboratory confirmed
	Incidence-based
<b>Perspective</b>	Societal
<b>Discounting</b>	Not needed (time horizon less than one year)



Methods described in the WHO Manual for Estimating Disease Burden Associated with Seasonal Influenza published in 2015

## Study Methods

### Process for estimating the economic burden of influenza

Step	Process	Details
1	Identification of required resources	All resources used in the influenza episode
2	Planning the sampling frame and data collection	Overall planning for data-gathering
3	Measuring hospitalization resource utilization	Direct medical costs
4	Measuring ambulatory care resource utilization	
5	Determining unit costs	
6	Estimating out-of-pocket and indirect costs	Direct medical and direct non-medical cost d indirect cost
7	Informal care costs among non-medically attended care	Direct medical, direct non-medical and indirect cost

## Study Methods

Bottom-up (micro-costing) approach- the cost estimation is stratified into three steps:

1. Measure and quantify the health inputs employed
2. Estimate the unit costs of the inputs used to produce and deliver influenza services
3. Multiply quantity used X unit costs

### Data Collection

- Received approval and support from health organization management
- Trained researchers gained informed consent from and enrolled participants at health organizations
  - Initial interview conducted at time of enrollment (by medical professional)
  - Follow-up data collection 10-12 days later (by epidemiologist)
- Data collection forms:
  - Interviews and medical record review with patients and caregivers at health organizations (ILI and SARI)
  - Follow-up interview/questionnaire of patient/caregiver
  - Health facility survey (OOP costs are low compared to facility costs)

## Analysis of Patient Costs

As described in the methods, **Resource Use X Unit Cost**

Calculate the following indicators (presented as mean and standard deviation):

1. Cost per inpatient episode for confirmed seasonal influenza treatment
2. Cost per outpatient episode for confirmed seasonal influenza treatment
3. Out-of-pocket costs per inpatient and outpatient episode
4. Total treatment cost per patient, with and without indirect costs

**Estimates are typically calculated as a total cost for a given annual disease burden.**

Economic burden results can be presented from various perspectives – i.e. government, household (including direct non-medical cost and informal care cost), or **indirect cost incurred to society**.

## Challenges Due to COVID-19

Our data collection reality:

- Influenza Coordinator at the SSES had overall responsibility to oversee the patient-level data collection
- SSES Economist had overall responsibility for primary data collection at the health organizations
- Data collection was planned to take place from December 2019-mid 2020
- Patient questionnaires/data collection forms were completed in hard copies by the medical professionals at the time of enrollment and
- AtlasTi database for the study was delayed in development due to staff being focused on other priorities

Beginning in February 2020, travel restrictions began due to COVID-19 and all SSES staff began working on COVID-19 preparedness (despite no cases in Kyrgyzstan)

- We faced resistance from respondents at the health organizations to participate in the data collection (particularly the financial staff who were providing information on health facility costs)

## Challenges Due to COVID-19

### March 2020: State of Emergency declared, lockdown and curfew

- Medical staff were functional but non-medical staff were working remotely (only emergency services allowed to work)
- Study was postponed
- Peak of cases (end June-end July)
- We have also dealt with annual and sick leave (from August-October)

### October Election:

- Unrest following the election further complicated the study as the offices of the Fund of Mandatory National Health Insurance and the Ministry of Health were destroyed

## Take-Aways, Where are we now?

To supplement the primary data on resource utilization and costs that we have had challenges collecting, we have:

- Requested utilization and cost data from national-level stakeholders (such as datasets and price lists, budgetary information, and cost of routine services)

Requested this information from:

- Financial Policy Department
- Department of Health Care Organization and Drug Policy
- Procurements Organization Sector
- Public Health Department

Have incentivized financial officer respondents at the health organizations to help ensure their participation during this difficult time.

Because of the delay in gathering the data, it would have been nice to have been able to collect information on comorbidities between influenza and COVID-19. We are adding this into our work in other countries.

