



## The Relation between Influenza Pandemics and Solar Activity

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### Abstract

Influenza is a highly infectious and lethal viral disease, it appears on Earth periodically in connection with the passage of comet in the vicinity of Earth around the Sun .it is believed that particles spread from the tail of the comet due to solar heating energy ,are contaminated with very tiny small particles considered as viruses. Viruses reach the Earth with the power of the solar wind due to solar activity cycle which is driven every 11 year. Viruses pushed towards Earth's atmosphere, then precipitate on clouds and reach the surface of Earth. These viruses are very well shielded and unaffected by even UV radiation ,but the only way the shell is melt when they passes through the digestive system . Results showed a good correlation between sunspots cycles and influenza epidemics events.

**Keyword:** Pandemics and Solar Activity, Influenza from space, Diseases from space

### العلاقة بين أوبئة الإنفلونزا والنشاط الشمسي

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### الخلاصة:

الانفلونزا مرض فيروسي معدي وقاتل جدا يظهر على الارض بشكل دوري بالارتباط مع مرور مذنب على مقربة من الارض حول الشمس . يعتقد بان الجسيمات نشرت من ذيل المذنب بفعل قوة الطاقة الشمسية ، الملوثة بدقائق صغيرة جدا والتي اعتبرت كفيروسات . الفيروسات تصل الارض بسبب قوة الرياح الشمسية الناتجة من دورة النشاط الشمسي التي تكمل دورتها كل 11 سنة . تندفع هذه الفيروسات الى الغلاف الجوي ، ثم تترسب على الغيوم وتصل سطح الارض . هذه الفيروسات محمية بغلاف لا يتأثر بفعل الاشعة فوق البنفسجية، ولكن هذا الغلاف يذوب عند دخول الفيروس الجهاز الهضمي . بينت النتائج وجود ارتباط جيد بين دورات البقع الشمسية واوبئة الانفلونزا.

### Introduction

Influenza is a highly infectious viral disease. Although its primary hosts are poultry and livestock, it can readily be communicated to people. Development of a pandemic depends upon a complex mixture of factors, ranging from the appearance of new viral strains, appropriate circumstances for communication to a viable seed group of humans, and conditions of social contact and population movement that give rise to its rapid spread through the human population. [1]

Astronomers Hoyle and Wickramasinghe carry on a dialog about comet tail delivery systems for extraterrestrial biological visitors. This would be consistent with the idea of panspermia, or life from outer space [2].

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Hoyle and Wickramasinghe postulate that micrometeorites carrying biological information (virus) are continuously invading the earth after crossing, without damage when enter atmosphere Earth [3].

Solar activity is measured by the number of sunspots which increased on the surface of the sun and reaches its maximum in average time every 11 years. Debris particles of comets tail speared near the Sun and will drifted away toward the Earth's atmosphere. Debris contain as well an molecules(organic and inorganic) microorganisms(viruses) these will be brought on the outer atmosphere layer (mesosphere) then to the middle layer (stratosphere) then to the lower layer (troposphere). Viruses eventually precipitate on clouds and carried down with rain. [4]

It is generally held that influenza viruses need a dry environment to stay alive until they reach their hosts. In the interplanetary space has been found to be extremely dry. [4,5]

### **Influenza Pandemics and sunspot cycle**

A possible connection between peaks of sunspot activity and the times of influenza epidemics on the basis of data over the year's interval time span 1755–2013, to take things a step further. [5]

Sunspot numbers give a measure of high energy activity at the sun's surface, the peak numbers corresponding with frequent solar flares and the emissions of charged particles that reach the earth. Such activity on the sun is known to result in geomagnetic storms, ionosphere disturbances that interfere with radio communications, and most spectacularly the production of bright aurorally displays, the latter being caused by the streaming of charged particles from the sun moving along magnetic field lines that connect the sun and the earth. Peaks of solar activity will undoubtedly assist in the descent of charged molecular aggregates (including viruses) from the stratosphere to the ground level. [5,6]

Sunspots are but one of many phenomena due to solar magnetic activity. Convective and shear flows in the plasmas of the solar interior give rise to electrical currents and thence to magnetic fields. These in turn erupt through the visible surface (the photosphere) of the Sun in an 11-year pattern. The presence of magnetic fields enables storage and subsequent catastrophic release of energy in flares, coronal mass ejections and other phenomena [6].

The influenza pandemic as well as having variations in their fine genetic detail, influenza viruses have larger differences which are classified into types A,B and C, and into sub-types of these main classes. Sub-types of A are particularly common, and it was a new sub-type of A that first appeared in Sardinia in 1948,commenting on this first appearance [7].

In establishing a connection between solar activity and the occurrence of pandemics we must consider three factors:

(a) The variable aspects of the Sun's behavior, and how they are related to the sunspot number and 10 solar activity, (b) The Earth's climatic and environmental responses to the various manifestations of solar activity, (c) How these responses can impact the origin and the propagation of the viral strain. These three topics cover a diverse range of topics, so the references include sources of general background information. [8]

The complex mix of societal and environmental factors makes it unlikely that a solar connection would be identifiable in the propagation of the virus. It is most likely that the solar connection is with the first factor: appearance of new viral strains [9].

### **Calculation and Result**

In the calculation of Solar activity is using reliable records of sunspot number dating back to at least 1700. Data about influenza pandemics in human history are available from the World Health Organization (WHO).

To show the relationship between the pandemics and the maximum of solar (sunspot) activity, the duration of each cycle was determined and the position of any pandemic that occurred in that activity cycle expressed in terms of phase offset in the cycle, defined by [9]:

$$\text{Phase Offset} = \frac{\text{Year of Pandemic} - \text{Year of Maximum}}{\text{Year of Cycle End} - \text{Year of Cycle Start}} \quad (1)$$

Figure-1, illustrates sunspot numbers (SSN) during the period (1755-2013) and table-1, is a calculated results for peaks of sunspot maximum for each cycle, together with types of pandemics occurred through the year of maximum solar activity by using equation above.

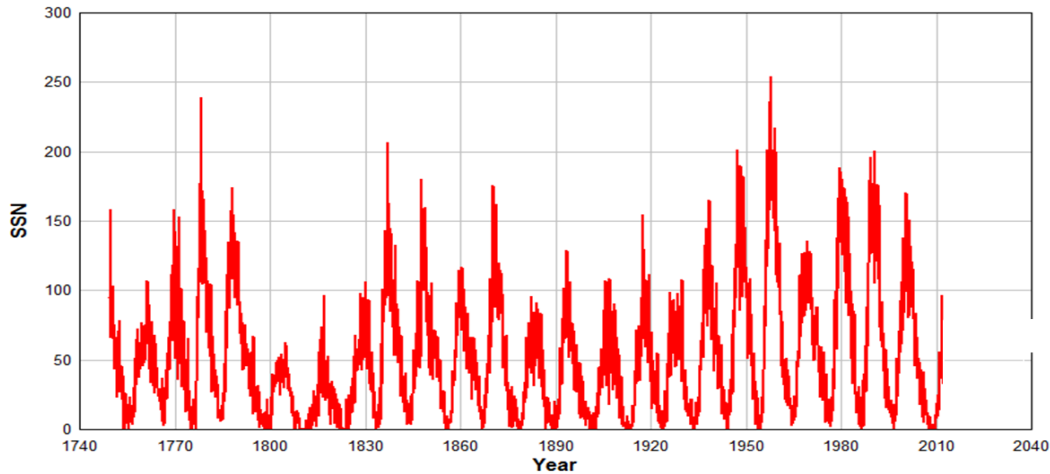
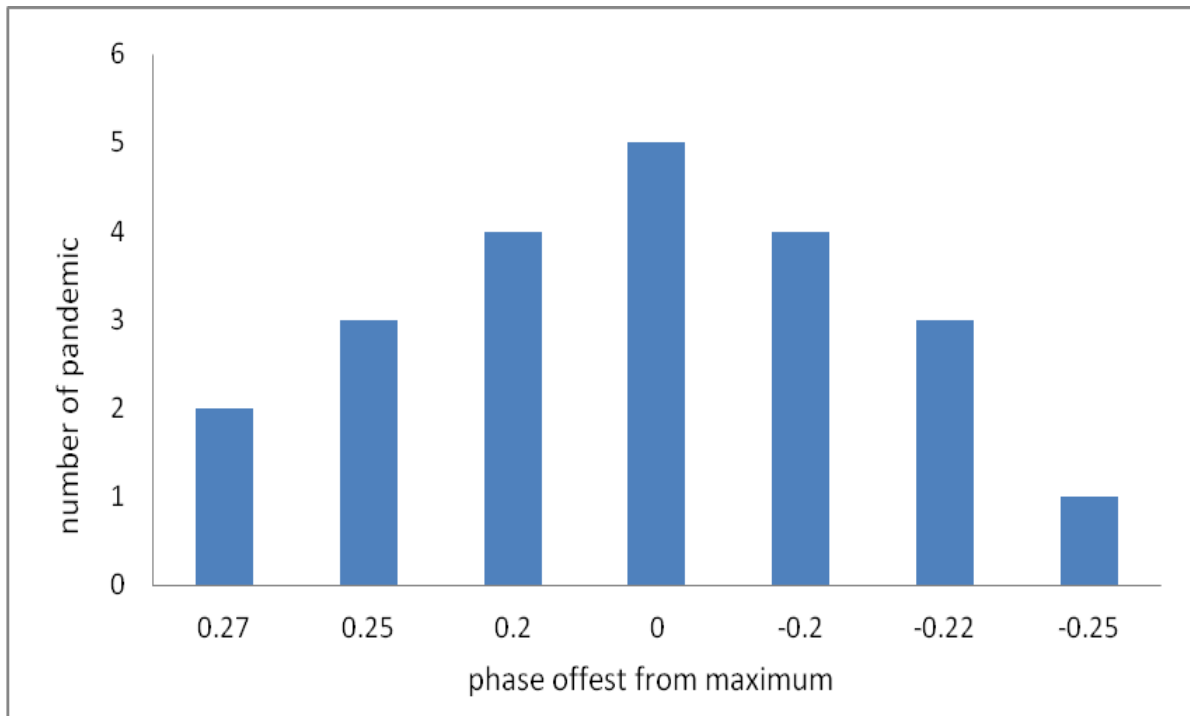


Figure 1- Sunspot cycle numbers [9].

Table 1- Results of calculated maximum of the sunspot and pandemics.

Solar cycle	started	Finished	sunspot maximum	year of Pandemics	phase Offset	Subtype of pandemic
1	1755	1766	1761	1759	-0.2	H2N2
2	1766	1775	1769	1767	-0.22	H3N2
3	1775	1784	1778	1776	-0.22	H1N1
4	1784	1798	1788	1791	0.2	H1N2
5	1798	1810	1805	1808	0.25	H3N8
6	1810	1823	1816	---	---	---
7	1823	1833	1829	1831	0.2	H1N3
8	1833	1843	1837	1837	0	H1N2
9	1843	1855	1848	1948	0	H0N1
10	1855	1867	1860	1858	-0.2	H2N2
11	1867	1878	1870	1873	0.27	H2N2
12	1878	1890	1883	1886	0.25	H5N1
13	1890	1902	1894	1897	0.25	H3N8
14	1902	1913	1906	1904	-0.2	H5N1
15	1913	1923	1918	1918	0	H1N1
16	1923	1933	1928	1930	0.2	H1N3
17	1933	1944	1937	1935	-0.2	H0N1
18	1944	1954	1947	---	---	---
19	1954	1964	1958	1958	0	H2N2
20	1964	1976	1968	1968	0	H3N2
21	1976	1986	1979	1977	-0.22	H1N1
22	1986	1996	1989	1991	0.2	H1N1
23	1996	2008	2000	1997	-0.25	H3N2
24	2008	2019	2012-2013	2010	0.27	H1N1

A histogram of the above result are plotted to show the gradual statistical numbers of increase and decreasing of infections throughout the period mentioned in table-1. This is done and shown in figure-2.



**Figure 2-** The histogram distribution of the numbers of pandemics as a function of phase offset from solar activity.

In the histogram-2, describes the distribution of the numbers of pandemics in table-1, as a function of phase offset from solar activity maximum, Activity maximum occurs at a phase offset of 0, and activity minima at phase offsets of  $\pm 0.27$ .

#### **Discussion and conclusion**

Those influenza outbreaks are often caused by newly arriving viruses from space. We notice that the worst flu epidemics coincide with peaks in of sunspot cycle. Influenza pandemics associated with antigenic shifts in the virus; the virus mutated to a different variety with each successive sunspot cycle, showing that the sun's radiation can disrupt the replication of a virus. Solar radiation appears to mutate the virus every 10 - 11years.

Results indicated that the various influenza pandemics that proliferated and killed across the world occurred at the peak, or just before or after the peak of periods of intense solar activity. Sunspots and solar flares walk hand in hand with influenza epidemics and most notably with that influenza particles travel from comets tail near the sun through space to spark off raging influenza blazes.

This result reveals correlations between plentiful sunspots and periods of heavy rain. Intense rainfall in the region often leads to flooding and disease outbreaks. The findings shed light on how life on Earth can be affected by changes in the Solar System environment, increasing sunspot numbers indicate a rise in the sun's energy output; rainfall will also peak the year before or after Sunspot maximum. There are several reasons for the effect of sunspot peaks on rainfall. Of which, increased solar energy associated with sunspots heats both land and sea, forcing moist air to rise and triggering precipitation.

The solar activity maximum is expect in the year 2013, it is result According to the Space Weather Prediction Center NOAA/SWPC, from 2011 until 2015 solar regulatory influences and concomitant geomagnetic field fluctuations may predispose to genetic and immunological alterations favorable to influenza epidemic spread.

We concluded that:

- (a) Occurrence of major influenza epidemics shows definite periodicity with an average period of 11.3 years, equal to the period of solar activity fluctuations.
- (b) As a rule, significant influenza epidemics do not occur in years of minimum solar activity.
- (c) Most major influenza epidemics occurred in time interval starting 2-3 years before and after ending 2-3 years of solar activity maxima.

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