



Adaptation of Health System to Climate Change Project

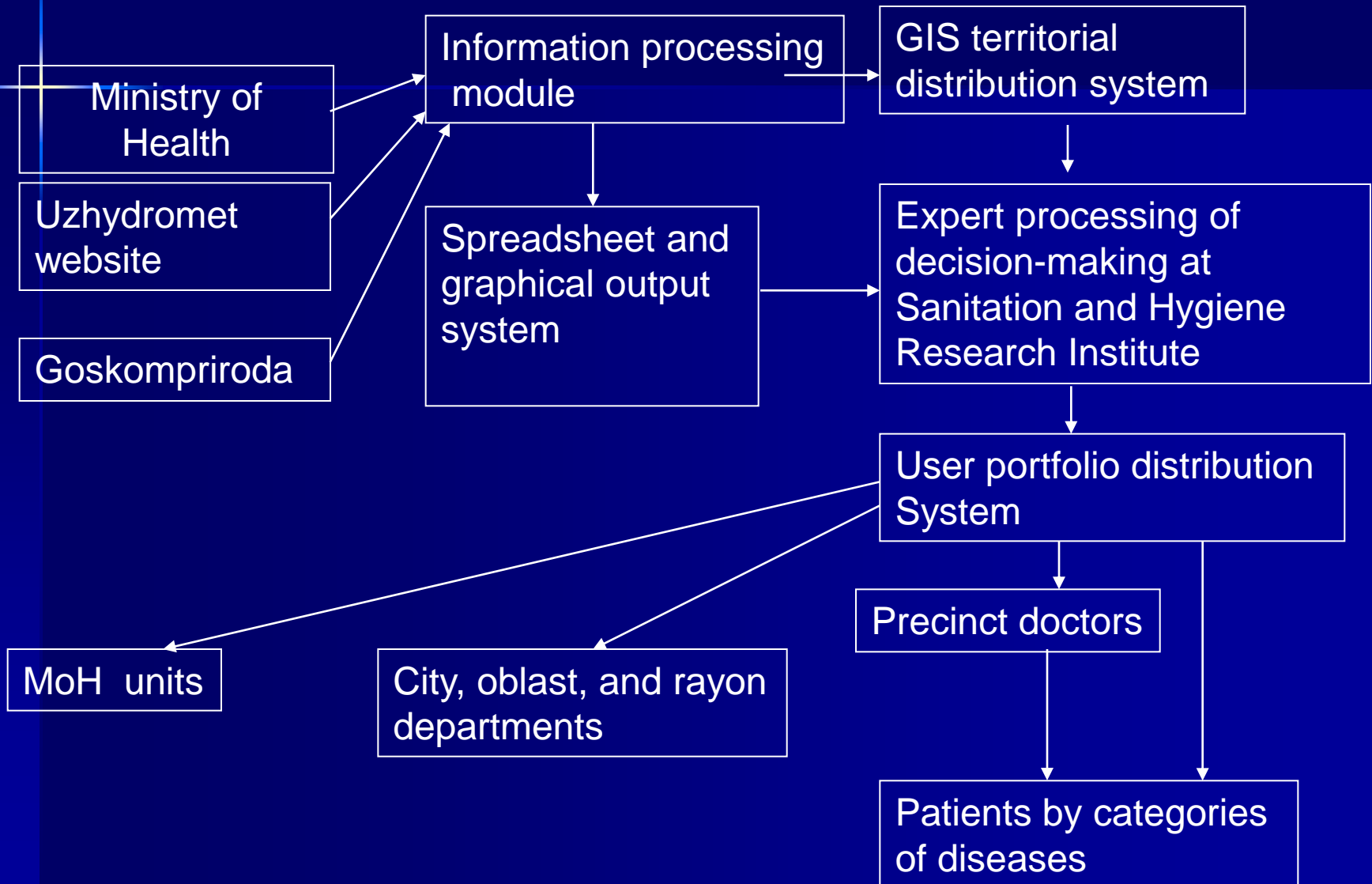
Early Warning System of the Risk of Climate Change-Sensitive Diseases

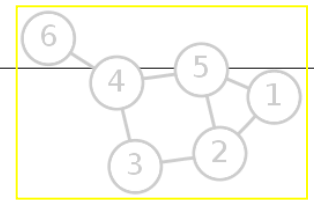
Dr. MYAGKOV
UZHMET

Implementation of the pilot *Adaptation of Health System to Climate Change* Project in the framework of the GEF international project, was started in Uzbekistan by the office of the World Health Organization (WHO), United Nations Development Programme in Uzbekistan (UNDP), Ministry of Health, Ministry of Emergency Situations (MES), Center of Hydrometeorological Services (Uzhydromet) under the Cabinet of Ministers, State Environmental Committee (Goskompriroda).

Development of the system for collection, processing, and disseminating information among stakeholders is the ultimate goal.

System for sharing, processing, and disseminating information





graphs

vertices

vertices. A graph may be undirected, meaning that there is no distinction between the two vertices associated with each edge, or its edges may be directed from one vertex to another; see graph (mathematics) for more detailed definitions and for other variations in the types of graph that are commonly considered. Graphs are one of the prime objects of study in discrete mathematics.

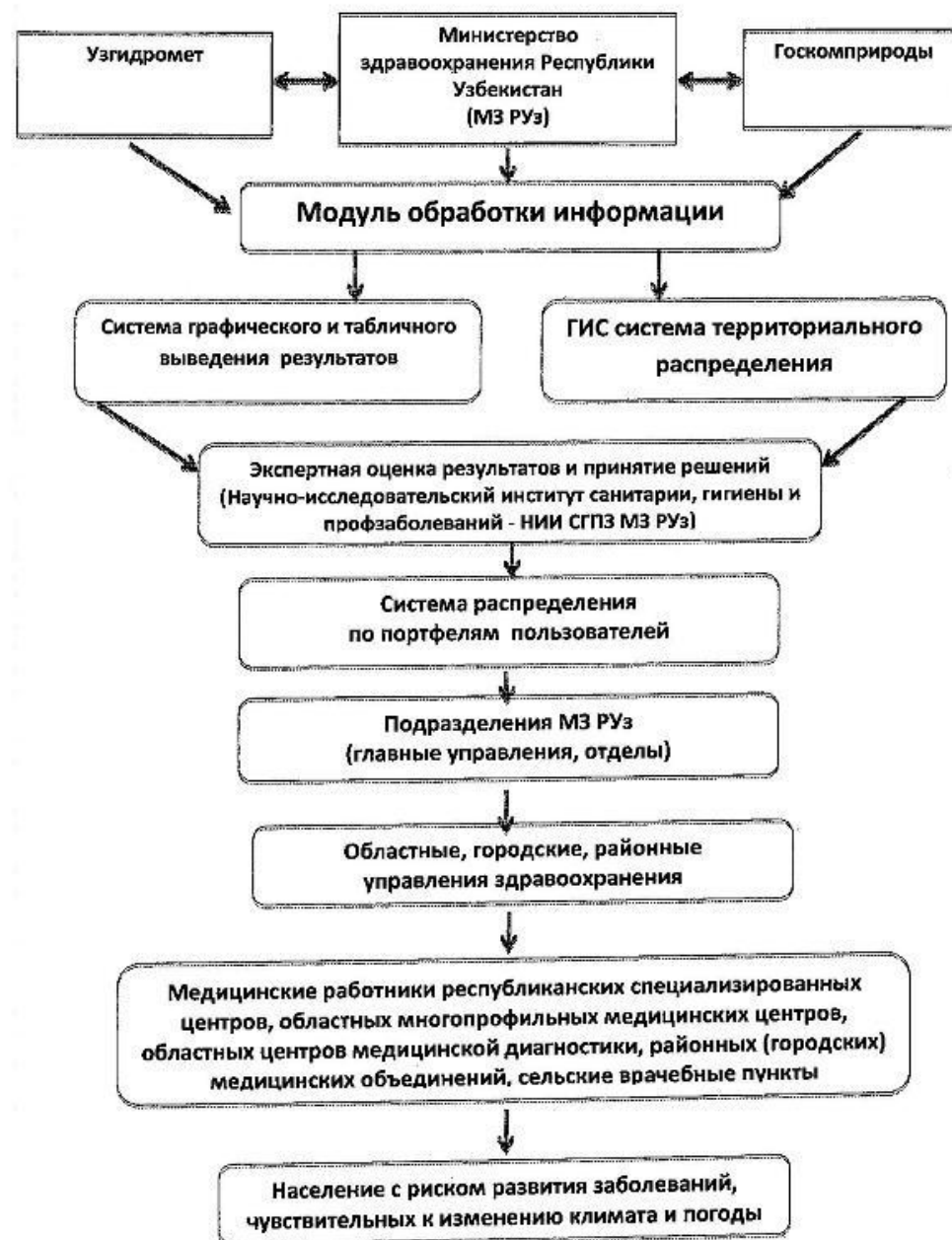
The graphs studied in graph theory should not be confused with the graphs of functions or other kinds of graphs.

Graphs are among the most ubiquitous models of both natural and man-made structures. They can be used to model many types of relations and process dynamics in physical, biological¹ and social systems. Many problems of practical interest can be represented by graphs.

In computer science, graphs are used to represent networks of communication, data organization, computational devices, the flow of computation, etc. One practical example: The link structure of a website could be represented by a directed graph. The vertices are the web pages available at the website and a directed edge from page *A* to page *B* exists if and only if *A* contains a link to *B*. A similar approach can be taken to problems in travel, biology, computer chip design, and many other fields. The development of algorithms to handle graphs is therefore of major interest in computer science. There, the transformation of graphs is often formalized and represented by graph rewrite systems. They are either directly used or properties of the rewrite systems (e.g. confluence) are studied. Complementary to graph transformation systems focussing on rule-based in-memory manipulation of graphs are graph databases geared towards transaction-safe, persistent storing and querying of graph-structured data.

http://en.wikipedia.org/wiki/Graph_theory

К МЕМОРАНДУМУ
по реализации пилотного Проекта
ВОЗ/ПРООН в Узбекистане
«Адаптация системы здравоохранения к изменению климата»,
финансируемого Глобальным Экологическим Фондом



Formal definition of graph is as follows: preset finite set of X , consisting of n elements ($X = \{1, 2, \dots, n\}$) known as the graph peaks and subset V of Cartesian product $X \times X$, i.e. $H \ V \ I \ X^2$ known as the set of arcs, then, G oriented by the graph is known as aggregate (X, V) (sum total of the X set and set of non-streamlined pairs of elements, each belonging to X set are known as non-oriented graph).

The arc between the peaks i and j , $i, j \in X$, will be indicated (i, j) . The number of arcs of the graph will be indicated as m ($V = (v_1, v_2, \dots, v_m)$).

Development of the composition of the standard format data:

There is a set of diseases $A [1...N]$.

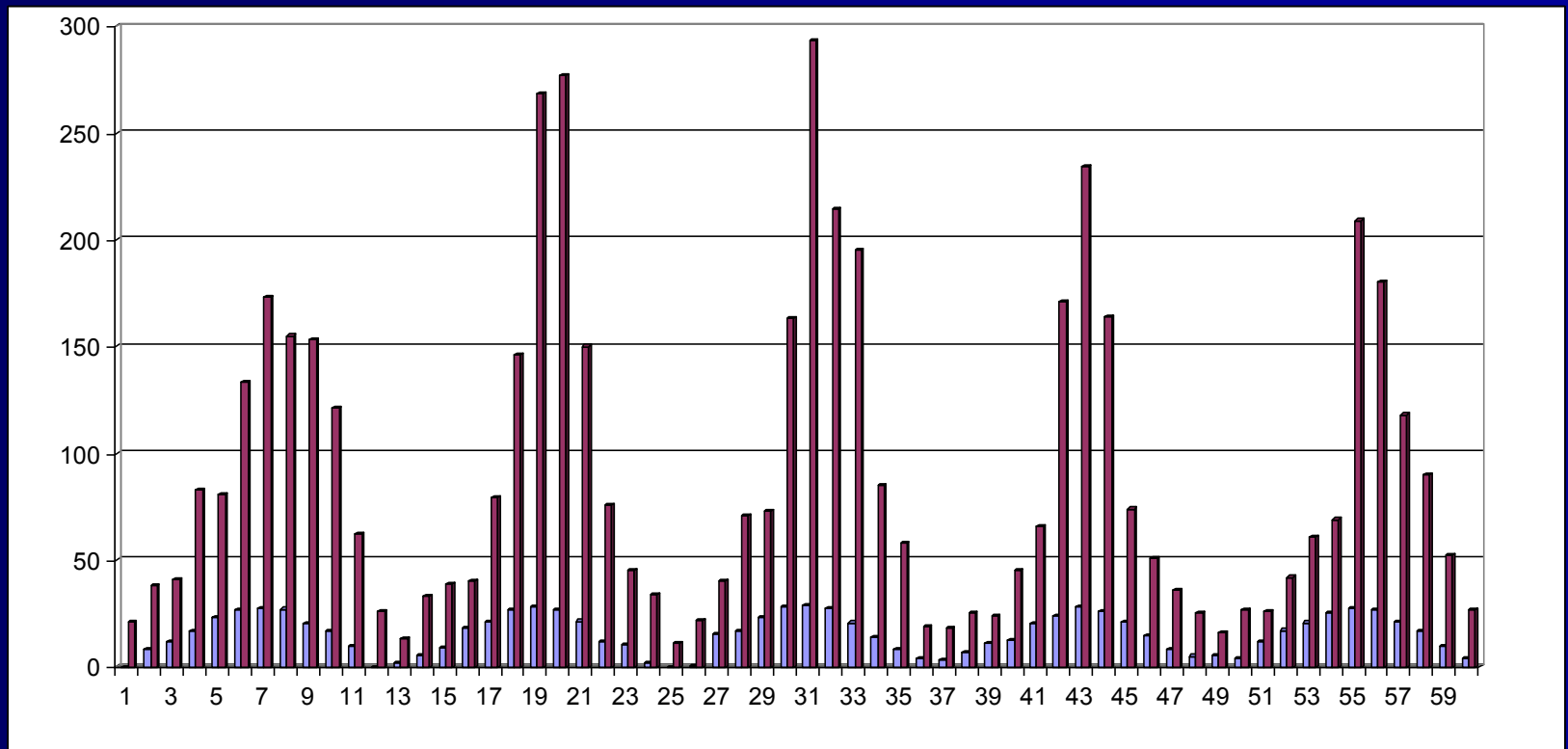
There is a set of weather and climatic factors $B [1...K]$

Dependency $A_i = F_i(B_j)$ is compared with reliability of P_i

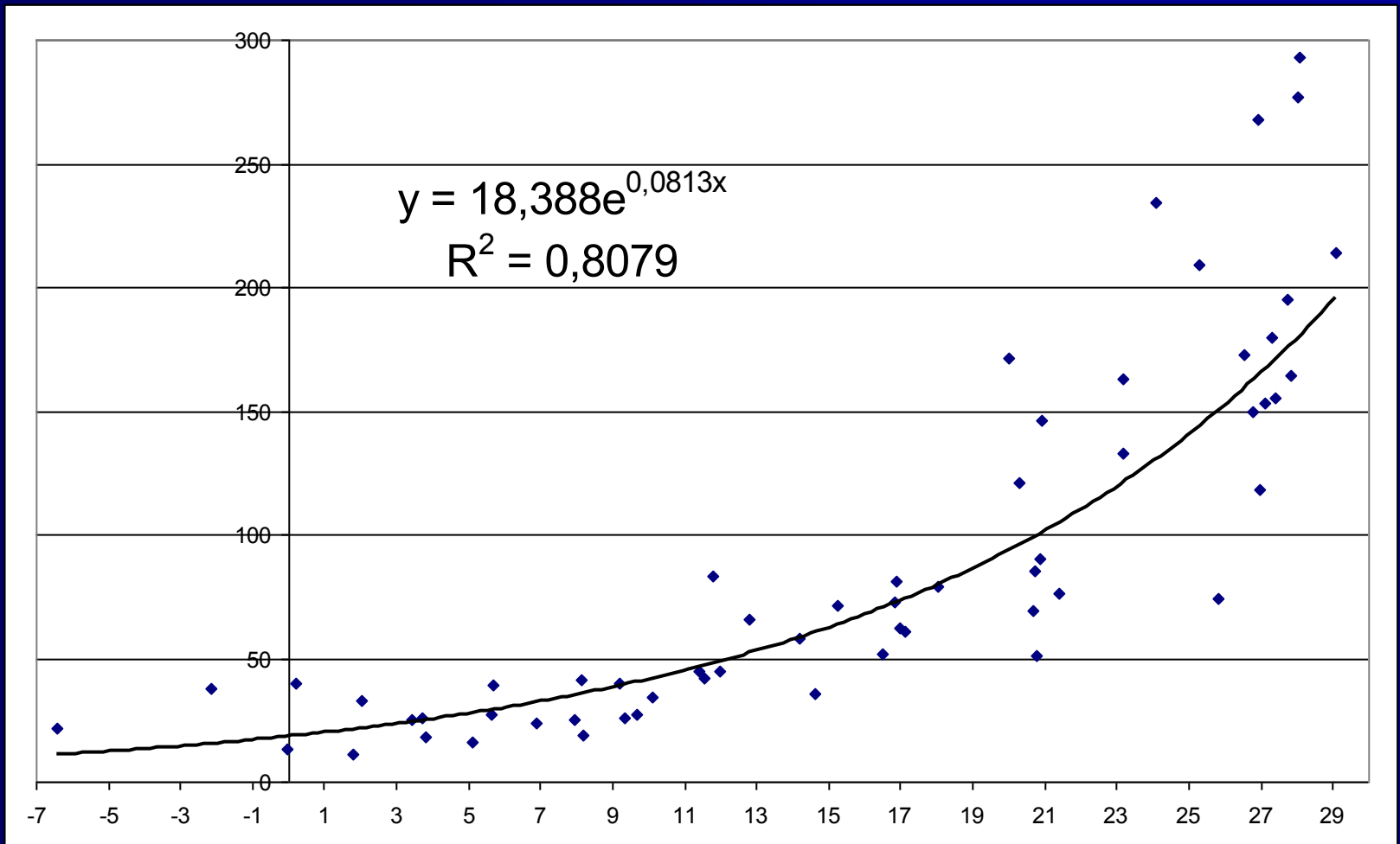
The core and the main thing

1. Due to the climate change in global scale, the number of extreme weather phenomena – air temperature variations, pressure variations, and storms has increased
2. The number of meteorological dependant diseases and vulnerable patients has increased.
3. According to the data of the survey conducted by the project in Tashkent and Syrdarya oblasts, the number of people sensitive to the weather factors is significant in the rural areas (climatic vulnerability – air conditioners and heaters)

Graph of Incidence of Acute Respiratory Infections (ARI) and Average Monthly Air Temperature



Dependence of ARI from Daily Average Air Temperature with 1 month shift



Daily weather and climatic data are available, and the incidence data are available for 10-day or monthly intervals.

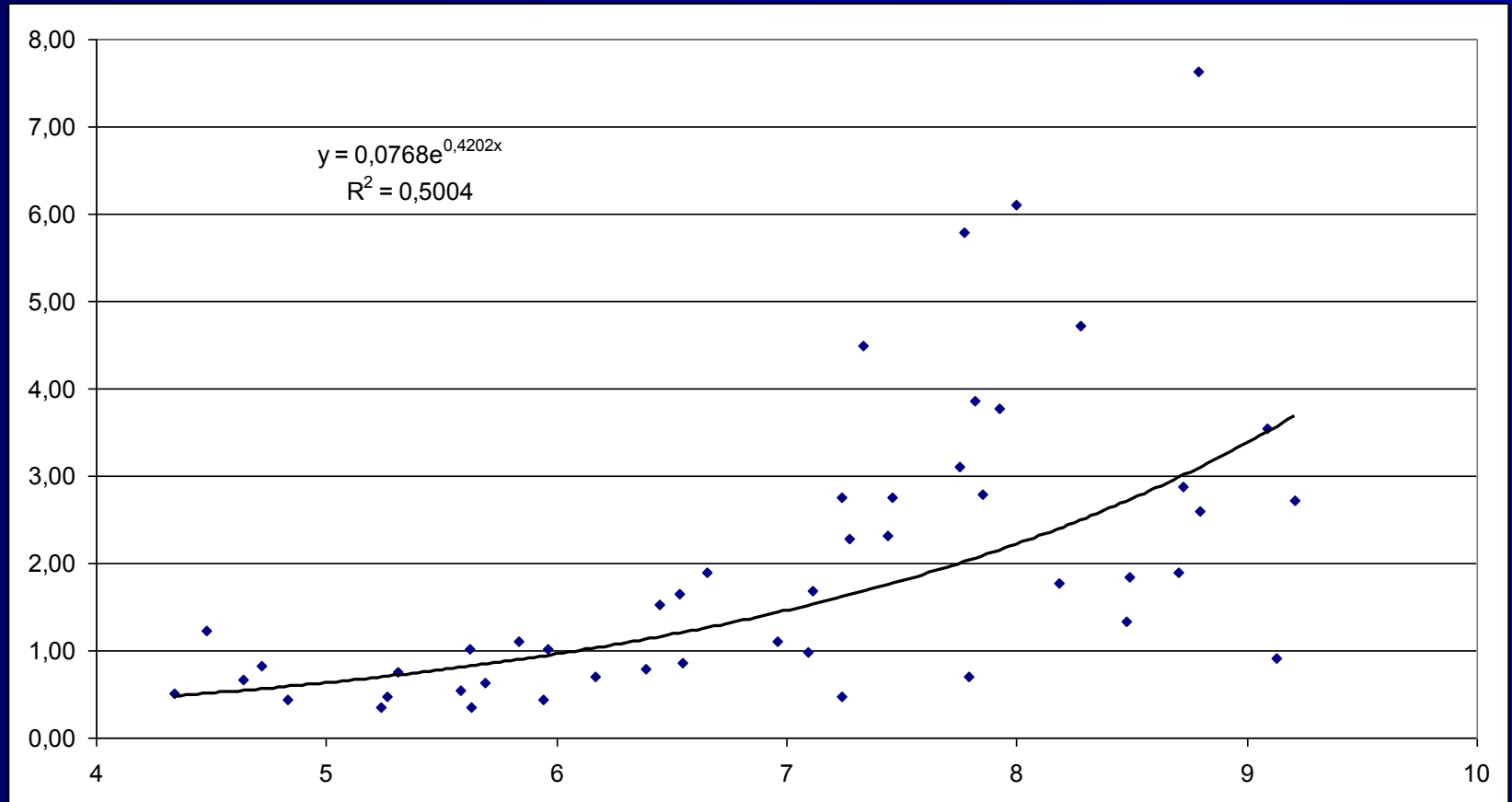
It is known that people are more sensitive to sharp weather fluctuations than to seasonal variations, then, estimated sum of monthly fluctuations of absolute values are used to determine correlation:

$$B_i = \sum |b_{j+1} - b_j|$$

Average daily deviations of the weather factor in absolute values in a given month were summed up and correlation of the risk of diseases in this month with the sum of daily fluctuations were estimated.

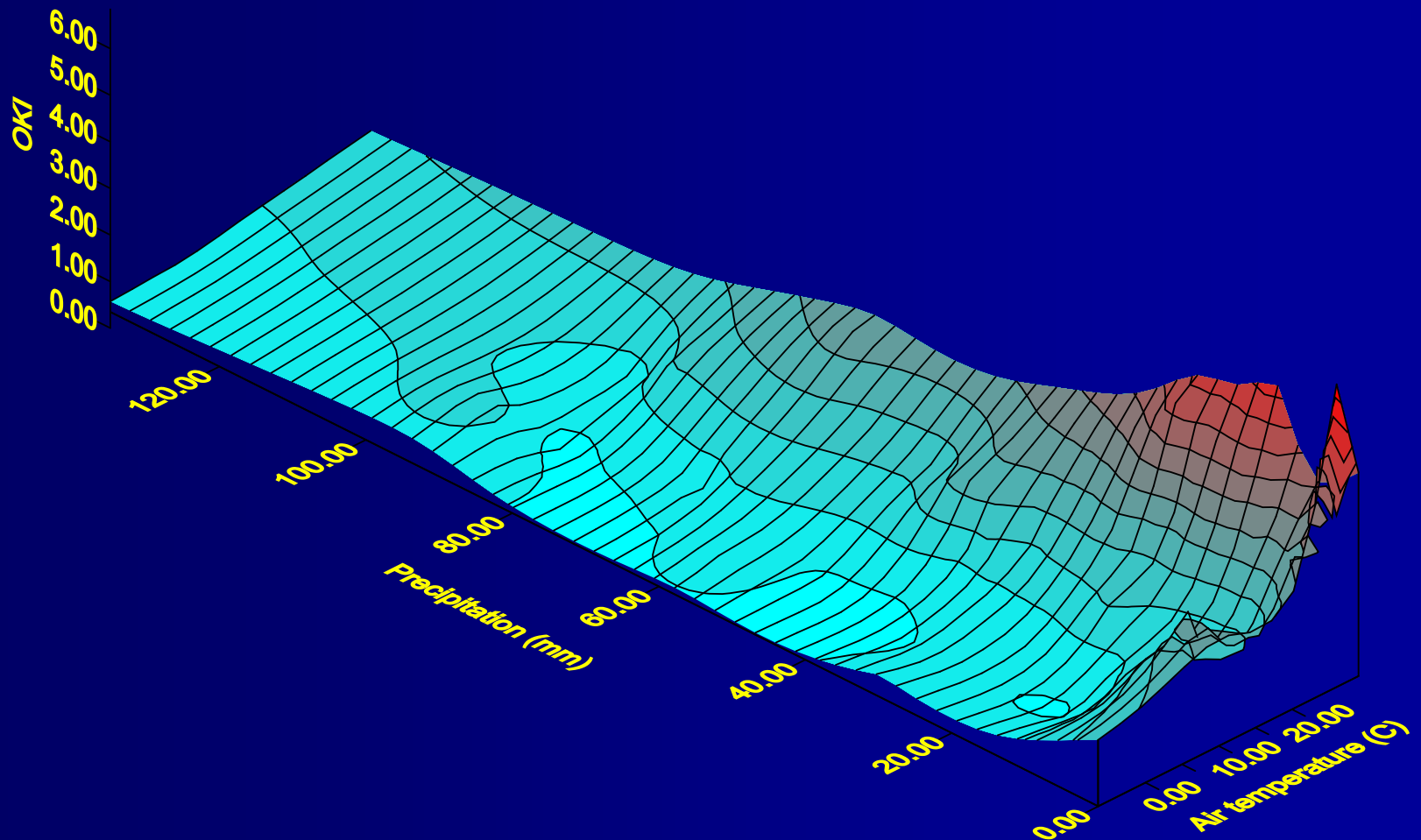
Thus, all data became comparable in time interval.

Correlation of ARI with average monthly sum of daily variations of maximum and minimum air temperatures



This approach enabled to conduct multi-factor analysis of incidence from different types of weather indicators, which raised probability of the event

Example of the incidence of acute respiratory infections from air temperature and precipitation



In order to share information and facilitate accessibility of distributed users The site for sharing with built-in database and calculation model has been created. Generally accessible medical projections will be made available on the website. Based on the analysis of estimated data and geoinformation system.

Meteomed.uz - Windows Internet Explorer

Файл Правка Вид Избранное Сервис Справка

http://www.meteomed.uz/


Коллекция веб... Рекомендуемые...

Meteomed.uz

Система раннего оповещения для предупреждения заболеваний, чувствительных к изменению климата

UNDP Uzbekistan Глобальный Экологический Фонд Министерство здравоохранения МИНЗДРАВ Госкомстат Узбекистан УЎЗГИДРОМЕТ

О проекте



Узбекистан является частью Глобального пилотного проекта по адаптации здравоохранения к изменению климата и прилагает усилия по наращиванию потенциала национальных учреждений, необходимому для разработки и опытного испытания системы раннего предупреждения для реагирования на заболевания, подверженные влиянию климатических факторов, такие как сердечно-сосудистые заболевания, диарея, заболевания дыхательных путей. Адаптация системы здравоохранения будет осуществляться посредством межатласового сотрудничества, определения и сбора соответствующих данных у организаций-участниц, изучения и применения международной практики и опыта.

Климат — статистически устойчивое явление, присущее определенной местности с многолетним закономерно повторяющимся режимом погоды. **Погода** — совокупность физических свойств приземного слоя атмосферы в относительно коротком отрезке времени (часы, сутки, недели). Погода характеризуется совокупностью таких метеорологических факторов, как температура, влажность, скорость и направление движения воздуха, атмосферное давление, прозрачность и электрическое состояние атмосферы, характер облачности, наличие осадков. Следовательно, погода является комплексным физиологическим раздражителем. Известно, что резкие изменения метеорологических факторов существенно влияют на физиологические процессы в организме человека, вызывают развитие патологических состояний и обострение хронических заболеваний. Такая реакция организма на изменение погоды получила название «**метеотропных реакций**». И хотя люди имеют большой потенциал адаптации к условиям изменяющегося климата и окружающей среды, тем не менее, они становятся уязвимыми, когда в окружающих их метеоусловиях происходят серьезные изменения.

Метеочувствительность — это реакция организма на воздействие метеорологических (погодных)

Разделы

- О проекте
- Участники проекта
- Меморандум
- Для населения
 - Прогноз УЎЗГИДРОМЕТА
 - Рекомендации Минздрава
- Для медицинского персонала
 - Данные о заболеваемости
 - Данные о выбросах
 - Аналитическая информация (карты, графики)
- Библиотека
- Документы
- Статьи

Войти

Имя пользователя:

Пароль:

☐ Запомнить меня

Готово

Интернет

100%

Система раннего оповещения о риске возникновения заболеваний - [Онлайн база данных](#)

search sql (total: 30) SELECT medicine_id, medicine_num, medicine_oblast, medicine_district_number, medicine_district, medicine_population, medicine_year, medicine_month, medicine_bakdezi, medicine_intbakdezi, medicine_oki, medicine_intoki, medicine_gepA, medicine_intgepA, medicine_gepE, medicine_intgepE, medicine_brushstf, medicine_intbrushstf FROM medicine WHERE 1=1 ORDER BY num ASC LIMIT 0, 30

search sql (total: 12) SELECT medicine_id, medicine_num, medicine_oblast, medicine_district_number, medicine_district, medicine_population, medicine_year, medicine_month, medicine_bakdezi, medicine_intbakdezi, medicine_oki, medicine_intoki, medicine_gepA, medicine_intgepA, medicine_gepE, medicine_intgepE, medicine_brushstf, medicine_intbrushstf FROM medicine WHERE 1=1 AND (medicine_district= Паркентский район) AND (medicine_year = 2006) ORDER BY 1 ASC LIMIT 0, 30

search sql (total: 12) SELECT medicine_id, medicine_num, medicine_oblast, medicine_district_number, medicine_district, medicine_population, medicine_year, medicine_month, medicine_bakdezi, medicine_intbakdezi, medicine_oki, medicine_intoki, medicine_gepA, medicine_intgepA, medicine_gepE, medicine_intgepE, medicine_brushstf, medicine_intbrushstf FROM medicine WHERE 1=1 AND (medicine_district= Паркентский район) AND (medicine_year = 2006) ORDER BY 1 ASC LIMIT 0, 30

POST: Array ()

GET: Array ([f_page_size] => 30 [f_sort_field] => [f_sort_field_by] => [f_sort_field_type] => [f_sort_type] => [f_ff_medicine_district_operator] => [f_ff_medicine_district] => Паркентский район [f_ff_medicine_year_operator] => [f_ff_medicine_year] => 2006 [f_ff_medicine_month_operator] => [f_ff_medicine_month] => [f_ff_searchType] => 0 [f_onSUBMIT_FILTER] => Найти)

Поиск

Район = Паркентский район
Год = 2006
Месяц = --любой--

Совмещение условий: и Сбросить Найти

+ Добавить	Id	Num	Oblast	District_number	District	Population	Year	Month	Bakdezi	Intbakdezi	Ok	Intok	GepA	IntgepA	GepE	IntGepE	Brushstf	Intbrushstf	Просмотр
Изменить	14	rec0114200601	1	14	Паркентский район	120847	2006	1	1	0,83		0,00	30	24,82	0,00		0,00		Изменить
Изменить	34	rec0114200602	1	14	Паркентский район	120847	2006	2	5	4,14	2	1,65	20	16,55	0,00		0,00		Изменить
Изменить	54	rec0114200603	1	14	Паркентский район	120847	2006	3	7	5,79	3	2,48	11	9,10	0,00		0,00		Изменить
Изменить	74	rec0114200604	1	14	Паркентский район	120847	2006	4	10	14,89	1	0,83	7	5,79	0,00		0,00		Изменить
Изменить	94	rec0114200605	1	14	Паркентский район	120847	2006	5	4	3,31	0	0,00	6	4,96	0,00		0,00		Изменить
Изменить	114	rec0114200606	1	14	Паркентский район	120847	2006	6	5	4,14	1	0,83	4	3,31	0,00		0,00		Изменить
Изменить	134	rec0114200607	1	14	Паркентский район	120847	2006	7	11	9,10		0,00	8	6,62	0,00		0,00		Изменить
Изменить	154	rec0114200608	1	14	Паркентский район	120847	2006	8	5	4,14		0,00	14	11,58	0,00		0,00		Изменить
Изменить	174	rec0114200609	1	14	Паркентский район	120847	2006	9	8	6,62		0,00	13	10,76	0,00		0,00		Изменить

Готово

Поле	Значение
Num	rec0114200601
Oblast	1
District_number	14
District	Паркентский район
Population	120847
Year	2006
Month	1
Bakdezi	1
Intbakdezi	0,83
Ok	
Intok	0,00
GepA	30
IntgepA	24,82
GepE	
IntGepE	0,00
Brushstf	
Intbrushstf	0,00

Назад

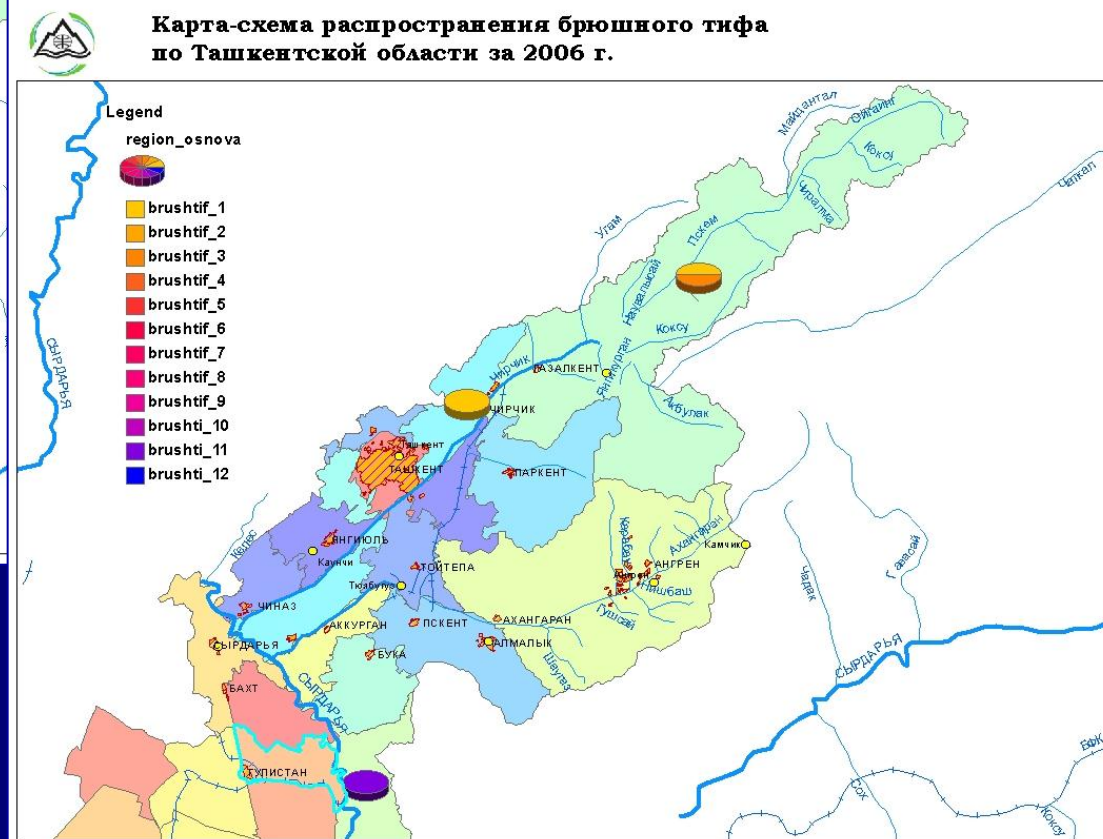
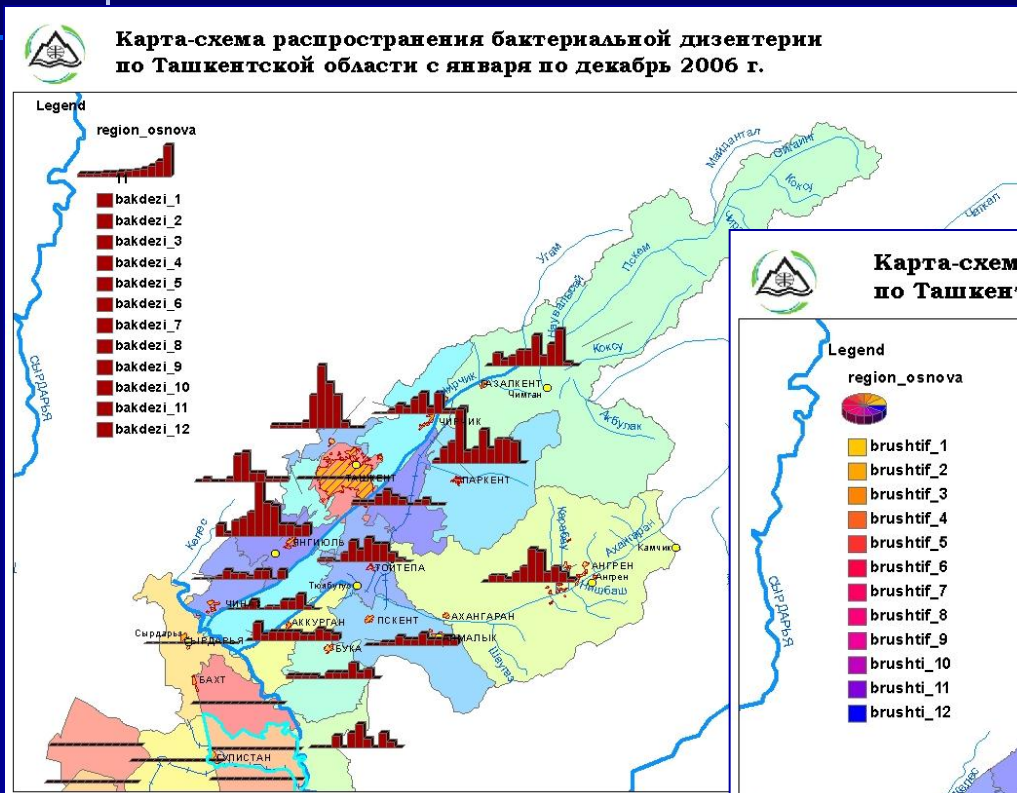
Скрипт выполнен за 0.073109 секунд

Готово

Интернет

The standard format data contained in the database enable:

1. Build tables of dependencies of diseases from the changes in climate and weather factors
2. Build maps of territorial distribution of incidence
3. Multifactor statistical analysis





region_osnova

☐ 1 Dot = 0,08

- oki_1
- oki_2
- oki_3
- oki_4
- oki_5
- oki_6
- oki_7
- oki_8
- oki_9
- oki_10
- oki_11
- oki_12

Conclusions

1. Early warning system of the risk of increasing incidence developed
2. Evidence-based correlations between the incidence and climate and weather factors identified
3. Platform for producing medical projections developed to obtain new knowledge of the morbidity risk

Thank you for your attention !