ASSESSING THE VALUE OF LOCAL HEAT DISCOMFORT FORECASTS IN LOMBARDIA

BY SURVEYING AND MONITORING END USERS

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OVERVIEW

Since the exceptionally hot summer of 2003 there is increased awareness and attention in the health community on the possibilities offered by heatwave and heat comfort forecasting. At national level, an epidemiological alert system is operational in Italy since 2005, issuing forecasts for the major urban areas. At local level, during summer 2006 the Regional Weather Service (Servizio Meteorologico Regionale-SMR) of Lombardia issued a daily short range forecast of heat discomfort to local health districts.

In this work we present the strategies adopted to assess the value and utility to the health care system of the issued forecasts, and some results obtained so far. A standard statistical analysis has been carried out to quantify forecast quality. However, in order to estimate forecast value it is necessary to include user issues in the analysis. As a first step, a survey on the whole group of users is underway in order to obtain a first, necessarily qualitative, value assessment. A feasibility study will follow to establish a descriptive decision model by further interaction with a subgroup of procedural decision makers.

1 – LOMBARDIA’S HOT AND HUMID SUMMERS ARE INCREASINGLY VIEWED AS A HEALTH HAZARD

Lombardia is delimited to the north by the southern ranges of the Alps and to south by the northernmost Apennines, with the low-lying, densely urbanized Po plain in between. About 9 million people live there.

Po valley is characterized by continental climate, with hot and humid summers and weak winds. From May to September temperature highs are frequently above 30°C with relative humidity above 30%.

The national Heat Watch Warning System, based on the statistical correlation between specific atmospheric conditions (“heat waves”) and the increase of mortality, issues forecast and alerts only for the two main cities of Lombardia, Milano and Brescia.

However, atmospheric conditions leading to heat discomfort are widespread and frequent in the area, so the need for local weather information is felt strongly by the Regional Health Administration, in order to support health managers in all the provinces reached by the national alert system.

3 – THE FORECASTS QUALITY IS MEASURED BY STANDARD VERIFICATION METHODS

Verification was carried out on the forecasts reported on 90 bulletins (notes that the forecasts have not been stratified over provinces, so they are not independent).

The issued forecasts have been verified against the actual solar radiation and the actual T2m temperatures and relative humidities ECMWF-T511 forecasts.

Of the five discomfort levels, the highest never occurred nor was forecast. Level 4 was strongly underforecast, while the other more numerous levels were slightly overforecast.

Even so, the forecasting system has overall scores (HSS, PSS, ETS).

If persistence is used as reference forecast, the forecasting system does not show marked score improvement, with skill on ETS mainly below 30%

Forecasts gain skill with forecast range (below 15% for the same day, below 30% for day 1 and 2).

Forecasts have lower skill on higher levels, ranging from 15 to 35% on category 1, from 6 to 20% on categories 2 and 3, and none (<5%) reached on category 4.

Is the forecast information useful at the present level of skill? Does it have any value? Users must be asked!

CONCLUSIONS AND FUTURE DEVELOPMENTS

The bulletin “HUMIDEX” was issued during last summer in Lombardia in order to support activities of heat discomfort mitigation. It shows promising characteristics for establishing a good user-oriented verification system: it is “experimental” (that is, it can be easily adjusted), it reports forecasts of a single parameter, it is seasonal, it is directed to a well defined group of users which are both centrally coordinated and likely to possess an implicit or explicit decision model. Results from the quality analysis will hopefully lead to forecast improvement. But results from the online questionnaire survey will allow to assess the present value of the bulletin and to evaluate to what extent quality improvements lead to increased utility.

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