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BAYESIAN SPATIO-TEMPORAL PREDICTION OF CANCER DYNAMICS

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The article "Bayesian Spatio-Temporal prediction of cancer dynamics", published in Computers and Mathematics with Applications, is one of the prediction methods implemented in PreDySEC software. Using a prediction method and comparison with the real evolution (from analysis) a physician can observe if the prescribed treatment has the desired effect. The development of tumor models is important as they offer a way to better understand the kinetic growth of malignant tumors which may lead to the development of successful treatment strategies. My PhD research theme was to observe the dynamic of cancer tumors and to develop and implement new methods and algorithms for prediction of tumour growth. In this sense, I developed three methods of prediction and I plan to develop a new logical algorithm to predict the growing tumors in time and space. All these methods were implementing in PreDySEC (Prediction of Dynamic Shape Evolution of Cancer) software - a Matlab interface of mathematical algorithms. The mathematical methods and the research result of prediction are published in the following articles:
- Bayesian Spatio-Temporal prediction of cancer dynamics
- Two handy geometric prediction methods of cancer growth
- A geometric approach to cancer growth prediction based on Cox processes
I plan to develop the PreDySEC and offer an online platform for this software with friendly and easy-to-use graphical interface.

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STATE OF SANITATION AND HYGIENE OF PUBLIC PRIMARY SCHOOLS IN KAKAMEGA MUNICIPALITY, WESTERN KENYA

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This study assessed the state of sanitation and hygiene in public primary schools in Kakamega Municipality Division. All 25 public primary schools located in Kakamega Municipality Division participated. The descriptive cross-sectional study design was used. Stratified random sampling was used to select 400 pupils between class 4 and 7. Twenty-five (25) teachers were purposively sampled. Study tools used were an observational checklist and structured questionnaires. Data analysis was performed using SPSS version 21. Descriptive statistics including mean and cross tabulations were used. Pearson's Chi-Square test was used to determine relationships between the variables. Approval by Institutional Research and Ethics Committee of the Moi University and informed consent from all study participants was sought. The results indicated that the state of sanitary facilities in schools was poor, unmaintained and inadequate in almost 50% of schools. This demonstrated that investment in school infrastructure was not accorded due priority. Negative effects on pupil's health were due to inaccessible safe drinking water and inadequate sanitary infrastructure despite pupils demonstrating acceptable levels of knowledge on personal hygiene and sanitation. As a result, pupils suffered from communicable diseases such as diarrhea, flu, and typhoid which could be prevented by improving sanitation in schools. The study concluded that physical infrastructure in schools within the study area was in a deplorable state and inadequate for the pupil population. Gaps were identified in school management of resources and enforcement of school health laws.

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