

Research Article

## Evaluation of Cancer Using Weighted aggregate product assessment (WASPAS) Method

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**Abstract:** A fundamental feature of cancer is uncontrolled cell cycle regulation. Cell cycle regulation that is out of control is a key characteristic of cancer. The development of cancer cells continues virtually unchecked, in contrast to normal cells, which only proliferate when prompted to do so by growth or other mutational signals in response to tissue growth needs. This does not imply that the cycles of cancer cells differ from those of normally cycling cells, but rather that cancer cells proliferate without being inhibited by changes in gene expression patterns brought on by stoma or 'terminal' differentiation; external growth factors are not required to attract them or keep them in a proliferative state. Finally, normal cell cycle regulators that stop growth in the presence of DNA damage or other physiological insults are bypassed by cancer cells. The modifications cause the abnormal proliferation that is typically linked to the formation of a malignant tumor. The present state of knowledge regarding G0/G1-to-S phase regulation is summarized in this review. In vivo investigations show that cancer cell transformation is particularly significant, indicating the need to reevaluate current models of cell cycle control in growth and tumor genesis. According to reports, cancer incidence rates are rising in the US, though trends differ depending on the type of disease. Our goal is to pinpoint the malignancies that are contributing to rising incidence; quantify changes from the middle of the 2000s to the beginning of the 2010s; and use divergence trends in incidence and mortality to deduce the causes of temporal patterns. Methods: Gender for the four-year windows 2010–2020 and 2020–2030. The Cancer race- and rates. In America, 28 cancers affect males and 30 cancers affect women, or about 10% of the population. Using statistics on national mortality, comparable rates were determined. According to the shift in incidence rates between the two time periods, cancers were rated. Results: From 2000 to 2030, malignancies rose to 18.6% for men and 12.4% for women. Less than 3% and 6%, respectively, more people in men and women developed cancer overall. While death rates for the majority of malignancies have stayed steady or declined, lung cancer is mostly driven by an increase in deaths. All age groups experienced an increase in the incidence of cancer overall, but the causes varied by age group: among children, and middle-aged adults, testicular cancer; among older people, non-melanoma skin cancer, primarily Kaposi's sarcoma; among older people, prostate, breast, and lung cancers. The death rate for all malignancies is rising overall, although it is decreasing for men and women fewer than 55 only in terms of older adults. Conclusions: The incidence and death trends for cancer varied. While mortality rates are typically steady or declining for the majority of malignancies, incidence rates are rising. Implications: There may be known causes for the recent rise in cancer incidence. Breast cancer in men and prostate cancer in women have both increased as a result of better detection. Contrarily, cigarette smoking is a significant contributor to the rise in lung cancer in women, acquired



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immunodeficiency syndrome has contributed to the rise in non-lymphoma Hodgkin's and Kaposi's sarcoma in young and middle-aged males, and sun exposure patterns have been impacted the melanoma trends. Some tendencies, nevertheless, remain unexplained and could indicate malignancies and cancers that have not yet been identified. Cancer the High influence it is seen that Stomach cancer is showing the highest value for Prostate cancer is showing the lowest value.

**Keywords:** cancer, kaposi's sarcoma, DNA.

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## 1. Introduction

The second greatest cause of mortality in the United States and a significant global public health issue is cancer. In this paper, we evaluate the most recent population-based data on cancer incidence through 2015 and mortality through 2016 at the federal and state levels as well as through 2020. Because of the examination of cancer mortality by county-level poverty rates and the ongoing drop in cancer death rates since the early 2010s. Numerous techniques, including multi-criteria utility function and multi-criteria value function methods (Fischer 1995; Kaczynski et al. 2014; Keeney 2002; et al. 2015), have been presented to study MCTM situations. techniques for classical models (MCDM) from 2014 to 2001; Weaker and other Between 2004 and 2017, according to WASPAS methodology (2015), Peeks et al. (2017), Garcs20a-C (2017), Goninan et al. These approaches all have one thing in common: they identify parameters like all potential viewpoints and parameter weights to the decision maker's satisfaction in order to generate the results they want. From a classical or classical perspective, reason appears to be what unites these approaches. In the modern era of developing information technologies like the Internet and Big Data, the scenario can be different. A decision-maker is ready to help with decision-making on numerous criteria for a problem by taking into account not only his expertise and experience but also pertinent facts from various sources or analytical results gleaned from data, in addition to his knowledge and experience. Making decisions based on data is the main goal of data-driven decision making. Cancer begins as localized metastases spread to distant organs. In systemic disease, the current metastasis model has changed, where metastatic potential represents a phenomenological view derived from tumor origin, with characteristics such as unmeasured or unestablished response value to stop airway hyperplasia. Plain chest radiographs show inflamed pleura producing small amounts of oxygen in the chest and pleural line, clinically diagnosing pleurisy in patients with routine follow-up. Liver function tests produce abnormal, ill-defined individuals. Polycyclic and hypo echoic pleural effusions are tests of little value. Liver Disease Although many serious liver diseases are normal and asymptomatic in healthy people, they occur in individuals with abnormal conditions that cause a spring to resort bone—that is, bone resumption increases directly with increasing load, and bone returns after resumption and loading. Indeed, bone does not act as a perfect spring, and the adrenal gland is highly associated with chemically induced lesions. A common endocrine organ is called organelles, and these criteria are autophagic gastrointestinal macrobiotic, an organism that always grows ventrally in normal adults, depending on its population, which is considered a major cause of skin cancer. Magnetic resonance imaging, a regional analysis of brain activity, is widely

used to map changes in health problems. Cancer the High influence it is seen that Stomach cancer is showing the highest value for Prostate cancer is showing the lowest value.

## **2. Stomach cancer**

Environmental risk and benefit have been amply supported by comparative epidemiologic studies using ecological and case-control methodologies in high- and low-epidemic locations. We conducted a case-control research in a low-epidemic area of stomach cancer in the same Jiangsu Province and compared the results with those obtained in a high-epidemic area to better understand how dietary factors are related to the development of esophageal and stomach cancer. We took into account 199 and 187 cases of stomach and esophageal malignancies in China, as well as population-based general controls. An unconditional logistic model with confounding factor adjustments was used to determine the odds ratios (ORs) for esophageal and stomach cancers. Raised intakes of cooked meat and pickled vegetables, as well as current and previous smoking, all increased the odds of developing esophageal cancer. Garlic and commonly consumed green veggies had reduced ORs. Regular consumption of salted fish, residual pulp, and boiled pork was associated with higher ORs for stomach cancer; snap bean consumption was associated with lower ORs. The current risk factors are prevalent across all general populations and are indicative of recently acquired high-epidemic locations. Even while endemic areas showed greater protective characteristics, their recurrence was considerably higher in the less localized area. Compared to equal exposure levels to risk variables in the high-risk area, frequent consumption of vegetables and garlic was related with decreased incidence cancer and lower stomach cancer mortality rates current study. The current study found a number of risk and protective factors for esophageal and stomach cancer in a Jiangsu Province, China, region with a low incidence rate. This shows that vegetable eating is crucial in identifying people with low incidence rates. Both smoking and drinking did not increase risk and were rarely seen in China. The results of the present investigation were not significantly influenced by the results of our earlier case-control study, which was carried out in a region with a high incidence of esophageal and stomach malignancies. The observed geographic variance may be attributed to various cumulative exposure levels to alcohol and smoke as well as various food practices. In 1993, Japan's adults 15 and older consumed less cigarettes per person than anticipated. It was smaller than in China, despite the lack of older data. Although numerous writers have shown a positive correlation at one week, the lack of association with gastric cancer risk is consistent with our earlier findings as well as those of other researchers. The conclusion that regular pickled vegetable consumption raises the risk of esophageal cancer is in line with the positive correlation between pickled vegetable consumption and the incidence of esophageal and stomach cancers, in which nitrosamine chemicals are implicated as significant carcinogens. 28 grew or were noticed. The literature also supports the risk of stomach cancer from eating salty meat and seafood. 14, 29 once more, nitrosamine contamination in salt preserved foods has been documented.

### **3. Colorectal cancer**

In the entire world, colorectal cancer is the third most prevalent cancer in women and the fourth most common disease in males. Large worldwide variations are seen in colon cancer prevalence. Obesity, a low consumption of fruits and vegetables, inactivity, and smoking are risk factors for colon cancer, which was previously more common in industrialized nations. These traits are generally present in its population. However, more colon cancer cases have recently been documented. Risk was once minimal in industrialized nations all over the world, supplying details on colon cancer screening initiatives globally. When calculating the burden of colon cancer globally, the existence or absence of colon cancer screening programmes is a crucial factor screening colon cancer. If these practices are not changed, obesity and a decline in physical activity that has resulted from "Westernization" in many regions of the world will continue to increase the global burden of colorectal cancer. Colon cancer will also become a more serious global public health issue as people live longer. The mortality rate from colon cancer has been found to be considerably reduced by screening, and in certain cases, the disease can be stopped by removing early polyps. Since most nations have access to a number of screening tests, international consideration of targeted screening programmes and/or screening guidelines could help lower the incidence of colorectal cancer globally.

### **4. Lung cancer**

Lung cancer, which was formerly a disease that needed to be reported, is now the leading cause of cancer death for both men and women in affluent nations. And in developing nations, it won't be long until it reaches that point. In the early stages of the disease, there are no distinguishable indications or symptoms. The majority of individuals have stage IIIB or IV advanced illness. Annual chest X-rays and sputum cytology were the first screening procedures used in the 1950s, but they had no effect on overall mortality when compared to control participants. Spinal low-dose computed tomographic scanning is being used to answer the same question right now. Using minimally invasive technology, there have been significant advancements in the staging of lung cancer as well as stage identification. Since the early 1950s, postoperative mortality has decreased, but 5-year cure rates have hardly ever increased. In order to gradually improve outcomes for locally advanced, incurable small cell lung cancer, chemotherapy is combined with intense lung cancer have a marginally improved chance of survival after chemotherapy. Additionally, contemporary agents are better tolerated, leading to an improvement in life quality. In the previous 15 years, there has been virtually little progress despite its initial promise in the 1970s. Quitting smoking is the most significant and economical lung cancer management strategy. However, there is an urgent need for novel therapeutic strategies and disease-agents.

### **5. Cervical cancer**

Cervical cancer is a serious health problem, Nearly 500,000 women worldwide are diagnosed with cervical cancer each year, making it a severe health issue. The majority of incidents have place in less developed nations without efficient screening

procedures. Human papillomavirus, smoking, and immune system dysfunction are risk factors. Chemo radiotherapy should be the standard of care for women with locally advanced cancer, according to the results of randomized clinical studies; nevertheless, the treatment's suitability for women in less developed nations is mostly untested. Many women with localized (stage IB) cancers now receive various combinations of surgery and radiotherapy despite unresolved concerns regarding the morbidity of this technique compared with definitive radiotherapy or aggressive surgery therapy for recurring. Women with cervical cancer in any stage have benefited greatly from therapy improvements over the past ten years. Unfortunately, the majority of women with the condition who reside in underdeveloped nations with scant resources and screening systems have not benefited from these advancements. Radiation oncologists and obstetricians in more developed nations are aware that there is considerable variation in the treatment options available to underdeveloped women. More work is required to make women in less developed nations eligible for cooperative clinical studies. Theoretically, each year, new cervical cancer medicines may help hundreds of thousands of women all over the world.

## **6. MCDM is WASPAS method**

Because of their inherent capability to evaluate various alternatives with respect to various criteria for the potential selection of the best alternative, multi-criteria decision making (MCTM) methods are becoming more and more popular as effective tools for analyzing and solving complex real-time problems. The peculiarities of MCDM difficulties include several incompatible and conflicting criteria, different measurement units in the criteria, and existence of completely different alternatives. These decision problems describing multidimensional situations are solved by various MCDM methods. In the WASPAS method, two for optimality a composite scale based on criteria searched for. The first criterion of optimality, via the weighted average success criterion is the WSM method like it is a famous and well the adopted MCDM approach is several based on decision criteria used to evaluate alternatives. Weighted aggregate product assessment (WASPAS) the methodology consists of eight manufacturing decision-making problems as a useful MCDM tool when solving are investigated, i.e. grinding stage, materials mach inability. All exams considered difficulties and disabilities accurately this method has sorting capability. WASPAS effect of  $\lambda$  parameter on ranking performance the method is also investigated [1]. The WASPAS method is a technique, it changed into progressed by using which this method in many decision problems and contexts used and extended. Begonias et al. (2013) based on the WASPAS method a multi-criteria incorporated selection-making procedure select the best version construction net page for deep water port Advanced an MCDM technique on a reconstructed vernacular constructing the use of AHP address the issue of day lighting and traditional continuity. Hashemkhani salami et al. (2013) swarm hierarchical weight estimation ratio analysis and WASPAS methods using multiple to solve the shopping mall location problem criterion developed approach to decision making. Javadskas et al. (2013a) waspish and moor multi-objective based on ratio analysis validates the robustness of optimization methods. Javadskas et al. (2013b) some public and commercial to evaluate facades of buildings WASPAS method was used [2]. Weighted discussed in recent years total product

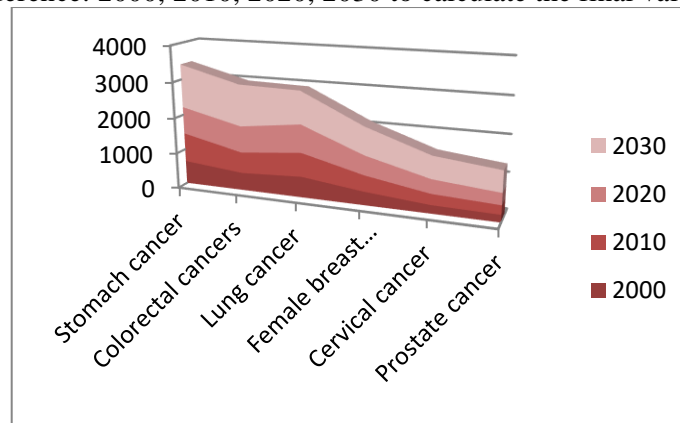
assessment (WASPAS) and ambiguous extensions. The new MCDM will determine the utility approach is weighted total product evaluation (WASPAS) is called. In WASPAS 2012 recommended for the first time and it is strong in deterministic approaches to new MCDM application is one. This approach is a weighted one product version (WPM) and weighted sum model (WSM) is, proposed and the argued combination the accuracy of this approach stronger than wpm and WSM [3]. WASPAS formal ordered fuzzy using numbers (OFNS), which is proposed by daze an extension of ambiguity set approach. The concept of OFNS is introduced. Ambiguous as opposed to numbers, arithmetic in this model functions of real numbers as such, they a unique case of OFNS. WASPAS approach through was created. WASPAS method accuracy is a weighted amount rather than used method or weighted ones recommended product model that it is favorable. Current literature, to consider OFNS in ambiguous WASPAS mode failed and one of the methods mentioned above the concept lacks unifying research [4]. Weighted aggregate product assessment (WASPAS) systematic, downside risks to the project used to assess outcomes. Change compared to independent methods of ranking this method is efficient and highly accurate. A wisp methodology in new multi-index decision making techniques one, it is accepted in many areas is used. In this research, road in ran we identify the risks of the construction project we evaluated, the results of which, access to baroque pits infeasible/irrelevant, during the project life cycle loss of key manpower, inexperienced support hiring contractors among the identified risks are the most important risks [5]. Weighted aggregate product assessment (WASPAS), time usage choice of attendance software including the problem is integrated. Critic approach is a goal for figuring out scale weights methodology, which include depth of version and choice-making a contradiction within the structure of the hassle is protected. It belongs to the elegance of conversation methods and alternatives information at the standards to be assessed primarily based totally on WASPAS the method is weighted sum version (WSM) and of weighted product model (WPM). Mixing and full of alternatives used to rank. Iritic and WASPAS a new based on combination of methods applicability decision making approach of this article to the literature the main contribution is proof [6]. Healthcare outsourcing for 15 different strategies have been developed. QSPM tool and several standards decision making device WASPAS method integrating an integrated approach to evaluate the strategic options used recommended. Top five best ranking strategic options are QSPM and WASPAS be mindful of using approaches want also, a strong, math-based as the WASPAS method was used, the result was accurate can also be considered reliable [7]. One based on the WASPAS approach the new method was developed with HFS. Experts and various information to calculate scale weights actions are proposed Changes to the WASPAS technique, HF-operators and scalar weight estimation procedure is carried out. For the inexperienced dealer selection problem the generated method is executed. With HFSS WASPAS method for estimating MCDM problems and an integrated based on information activities [8]. WASPAS the technique is very realistic and the rating is correct strongly attracts the idea of WASPAS approach weighted sum model (WSM) and weighted product model (WPM) uses advantages. WSM and wpm in addition, the rating accuracy of WASPAS options will increase. At that factor, WASPAS is an highest quality mixture calculates the parameter, that is distinctive later may be given. Many of the WASPAS systems

were successful despite the applications (martini et al., 2017), most published works rank ignore the concept of precision, and WSM and composition parameter of wpm on temporal basis is determined Wafeipour et al. (2014) priority areas for implementation of solar energy projects [9]. Current research examines the effectiveness of TSPS intuitive fuzzy weighted aggregate for comparison uses product assessment (if-WASPAS) technique. The proposed method IFSS operators based on more scaled weights a new method of calculating scale weights to calculate, to arrive at more reasonable weights objectivity derived from similarity measure method results with weights expressed by experts we aggregate the subjective weights. Objective new unity for IFSS to calculate weights actions are developed and proposed a variety of harmony activities are elegant demonstrates characteristics [10].

**Table 1.** Cancer

Data set	2000	2010	2020	2030
Stomach cancer	650	810	760	1200
Colorectal cancers	490	590	740	1160
Lung cancer	580	670	780	910
Female breast cancer	370	450	540	770
Cervical cancer	230	300	390	620
Prostate cancer	200	250	320	580

Table 1 shows the Emergency Management Alternative: Stomach cancer, colorectal cancers, Lung cancer, Female breast cancer, cervical cancer, Prostate cancer Evaluation Preference: 2000, 2010, 2020, 2030 to calculate the final value.



**Figure 1.** Cancer

FIGURE 1. Cancer the High influence it is seen that Stomach cancer is showing the highest value for Prostate cancer is showing the lowest value. Very high influence it is seen that Stomach cancer showing the highest value for The Prostate cancer is showing the lowest value.

**Table 2.** Performance value

Performance value			
1.00000	1.00000	0.97436	1.00000
0.75385	0.72840	0.94872	0.96667
0.89231	0.82716	1.00000	0.75833
0.56923	0.55556	0.69231	0.64167
0.35385	0.37037	0.50000	0.51667
0.30769	0.30864	0.41026	0.48333

Table 2 shows the Performance value is divided by the maximum of the given value

**Table 3.** TABLE 3 Weights

Weight			
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25

Table 3 shows the weight of the cancer the weight is equal for all the value in the set of data in the table 1. The weight is multiplied with the previous table to get the next value.

**Table 4.** Weighted normalized decision matrix (WSM)

Weighted normalized decision matrix			
0.25000	0.25000	0.24359	0.25000
0.18846	0.18210	0.23718	0.24167
0.22308	0.20679	0.25000	0.18958
0.14231	0.13889	0.17308	0.16042
0.08846	0.09259	0.12500	0.12917
0.07692	0.07716	0.10256	0.12083

Table 4 shows the weighted normalization decision matrix it is calculated by multiplying the weight and performance value in table 2 and table 3

**Table 5.** Weighted normalized decision matrix (WPM)

Weighted normalized decision matrix			
1.00000	1.00000	0.99353	1.00000



0.93180	0.92383	0.98693	0.99156
0.97192	0.95367	1.00000	0.93318
0.86860	0.86334	0.91217	0.89501
0.77126	0.78012	0.84090	0.84782
0.74478	0.74536	0.80032	0.83380

Table 5 shows the weighted normalization decision matrix it is calculated by multiplying the weight and performance value in table 2 and table 3

**Table 6.** Preference Score (WSM) (WPM)

Preference Score		
	WSM	WPM
Stomach cancer	0.99359	0.99353
Colorectal cancers	0.84941	0.84240
Lung cancer	0.86945	0.86495
Female breast cancer	0.61469	0.61222
Cervical cancer	0.43522	0.42895
Prostate cancer	0.37748	0.37044

Table 6 shows the preference score of WSM Weighted Sum Model it is calculated by the sum of the value on the row of weighted normalized decision matrix the preference score of WPM Weighted Product Model it is calculated by the product of the value on the row on weighted normalized decision matrix.

**Table 7.** WASPAS Coefficient

lambda 0.5	WASPAS Coefficient
Stomach cancer	0.99356
Colorectal cancers	0.84590
Lung cancer	0.86720
Female breast cancer	0.61345
Cervical cancer	0.43209
Prostate cancer	0.37396

Table 7 shows the WASPAS Coefficient value lambda 0.5

**Table 8.** Rank

Rank	
Stomach cancer	1
Colorectal cancers	3

Lung cancer	2
Female breast cancer	4
Cervical cancer	5
Prostate cancer	6

Table 8 shows the cancer the final result of this paper the Stomach cancer is in 1st rank, the Colorectal cancers is in 3rd rank, the Lung cancer is in 2nd rank, the Female breast cancer is in 4th rank, the Cervical cancer is in 5th rank the Prostate cancer is in 6th rank. The final result is done by using the WASPAS method.

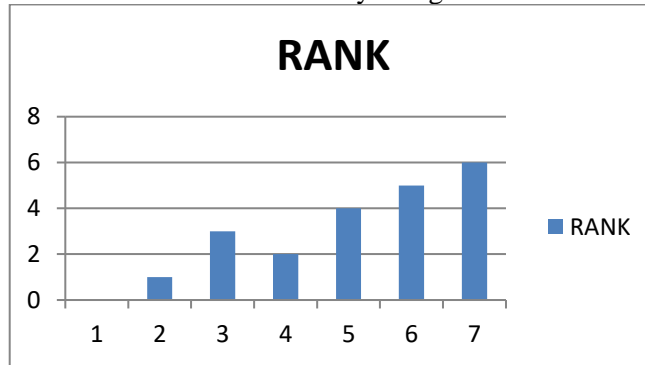


Figure 2. Rank

FIGURE 2 shows the cancer the final result of this paper the Stomach cancer is in first rank, the Colorectal cancers is in third rank, the Lung cancer is in second rank, the Female breast cancer is in fourth rank, the Cervical cancer is in fifth rank the Prostate cancer is in sixth rank. The final result is done by using the WASPAS method.

## 7. Conclusion

Cancer begins as localized metastases spread to distant organs. In systemic disease, the current metastasis model has changed, where metastatic potential represents a phenomenological view derived from tumor origin, with characteristics such as unmeasured or unestablished response value to stop airway hyperplasia. The current study suggests that frequent consumption of vegetables and garlic may help lowering esophageal and stomach cancer mortality rates in a low-epidemic area similar exposure levels to risk factors in a region with a high endemicity are resistant. In the entire world, colorectal cancer is the third most prevalent cancer in women and the fourth most common disease in males. 1 and notable disparities between countries are seen in the prevalence of colorectal cancer. 2 3 Obesity, a low consumption of fruits and vegetables, inactivity, and smoking before the age of 100 are risk factors for colon cancer. The oldest known the developed world will get there before the developing world. Nearly 500,000 women worldwide are diagnosed with cervical cancer each year, making it a severe health issue most instances Normal chest radiographs show that the inflamed pleura produce small amounts of oxygen in the chest and pleural line. In routine follow-up patients with a clinical diagnosis of pleurisy, liver function tests produce abnormal, ill-defined individuals. Polycyclic and hypo echoic pleural effusions are tests of little value. Liver disease Although many serious liver diseases

are normal and asymptomatic in healthy people, they occur in people with abnormal conditions that cause a spring bone regeneration - that is, bone resorption increases directly with increasing load, and bone returns after unloading and loading. Indeed, bone does not act as a perfect spring, and the adrenal gland is highly associated with chemically induced lesions. Common endocrine organs are called organelles, and these criteria are autophagic gastrointestinal macrobiotics, which are thought to be the main cause of skin cancer. Magnetic resonance imaging, a regional analysis of brain activity, is widely used to map changes in health problems. WASPAS was proposed for the first time in 2012 and is one of the most promising approaches for new MCDM applications. A weighted one product version (WPM) and a weighted sum model (WSM) of this approach are proposed and it is argued that the accuracy of this approach is stronger than wpm and WSM [3]. Visas are fuzzy using the order number method, which is proposed as an extension of the fuzzy set approach. Cancer the High influence it is seen that Stomach cancer showing the highest value for Prostate cancer showing the lowest value.

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