

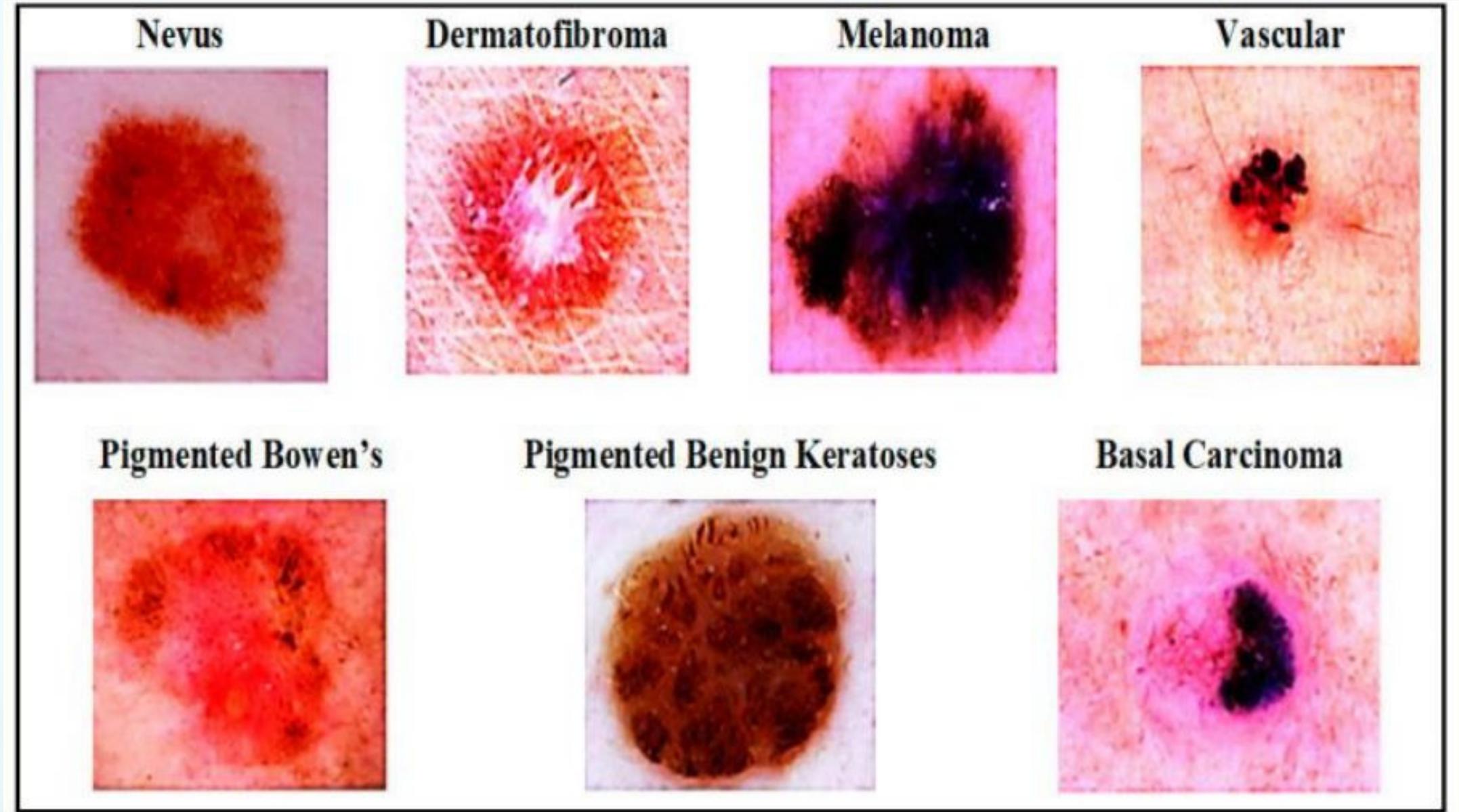
SKIN CANSEER DETECTION

"Melanoma"

Introduction

Skin cancer is one of the most active types of cancer in the present decade [1]. As the skin is the body's largest organ, the point of considering skin cancer as the most common type of cancer among humans is understandable [2]. It is generally classified into two major categories: melanoma and nonmelanoma skin cancer [3]. Melanoma is a hazardous, rare, and deadly type of skin cancer. According to statistics from the American Cancer Society, melanoma skin cancer cases are only 1% of total cases, but they result in a higher death rate [4]. Melanoma develops in cells called melanocytes. It starts when healthy melanocytes begin to grow out of control, creating a cancerous tumor. It can affect any area of the human body. It usually appears on the areas exposed to sun rays, such as on the hands, face, neck, lips, etc.

Types of Skin Cancers



Effect of Skin Cancer

Excessive and unprotected exposure to ultraviolet (UV) radiation from the sun or artificial sources, such as tanning beds, is a well-known and significant risk factor for skin cancer. UV radiation damages the DNA in skin cells, which can lead to the development of cancerous cells. There are three main types of skin cancer: basal cell carcinoma, squamous cell carcinoma, and melanoma.

factors for skin cancer include:

UV Radiation: Prolonged and frequent exposure to UV radiation increases the risk of developing skin cancer. This includes both direct sun exposure and indoor tanning.

Fair Skin: People with fair skin, light-colored eyes, and light hair are more susceptible to the harmful effects of UV radiation.

Moles: Having a large number of moles or atypical moles on the skin can increase the risk of melanoma.

Family History: A family history of skin cancer, especially melanoma, can increase your risk.

Weakened Immune System: Individuals with weakened immune systems, such as those undergoing organ transplants or living with conditions like HIV, have a higher risk of skin cancer.

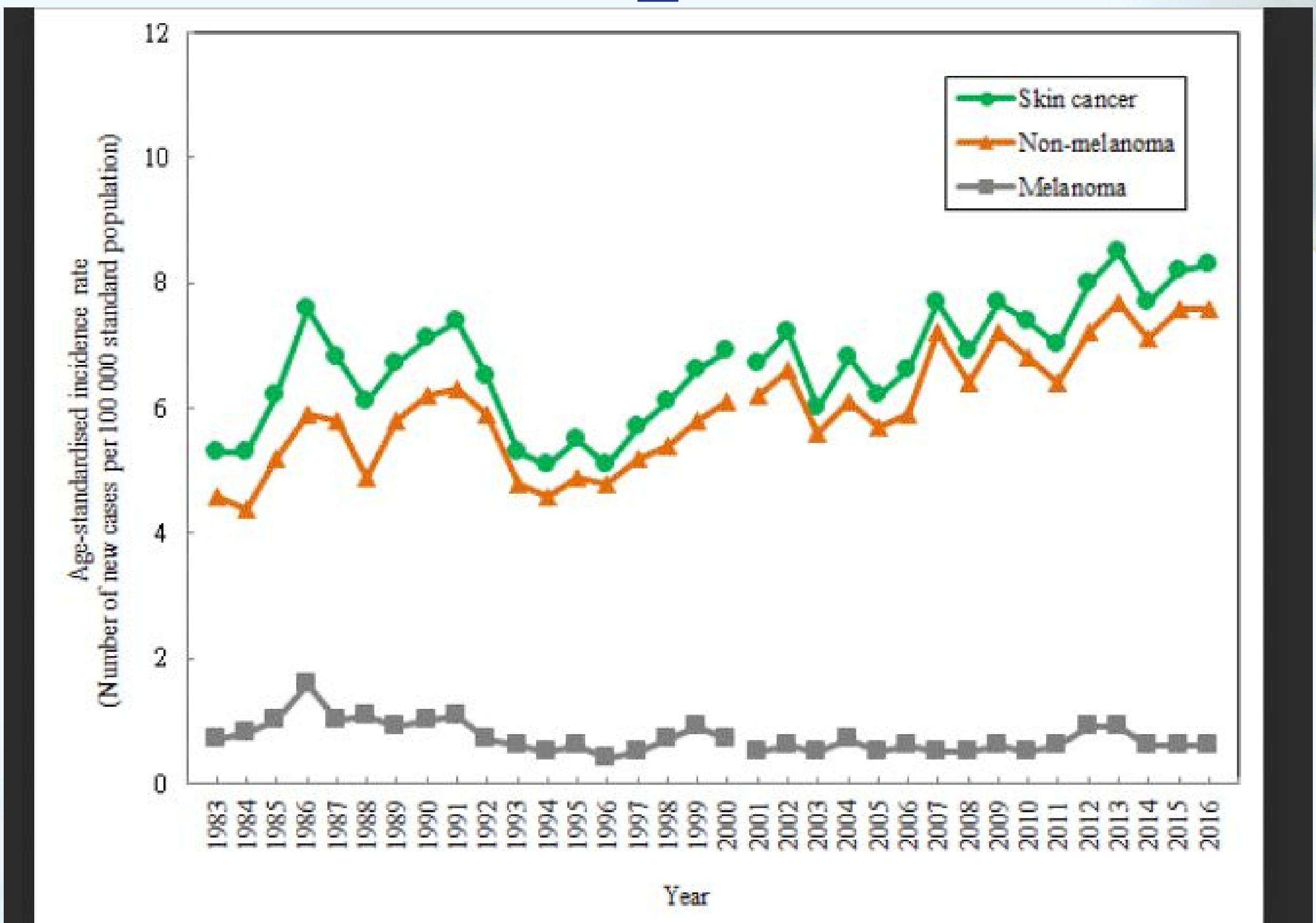
Age: The risk of skin cancer increases as you age, particularly for basal cell and squamous cell carcinomas.

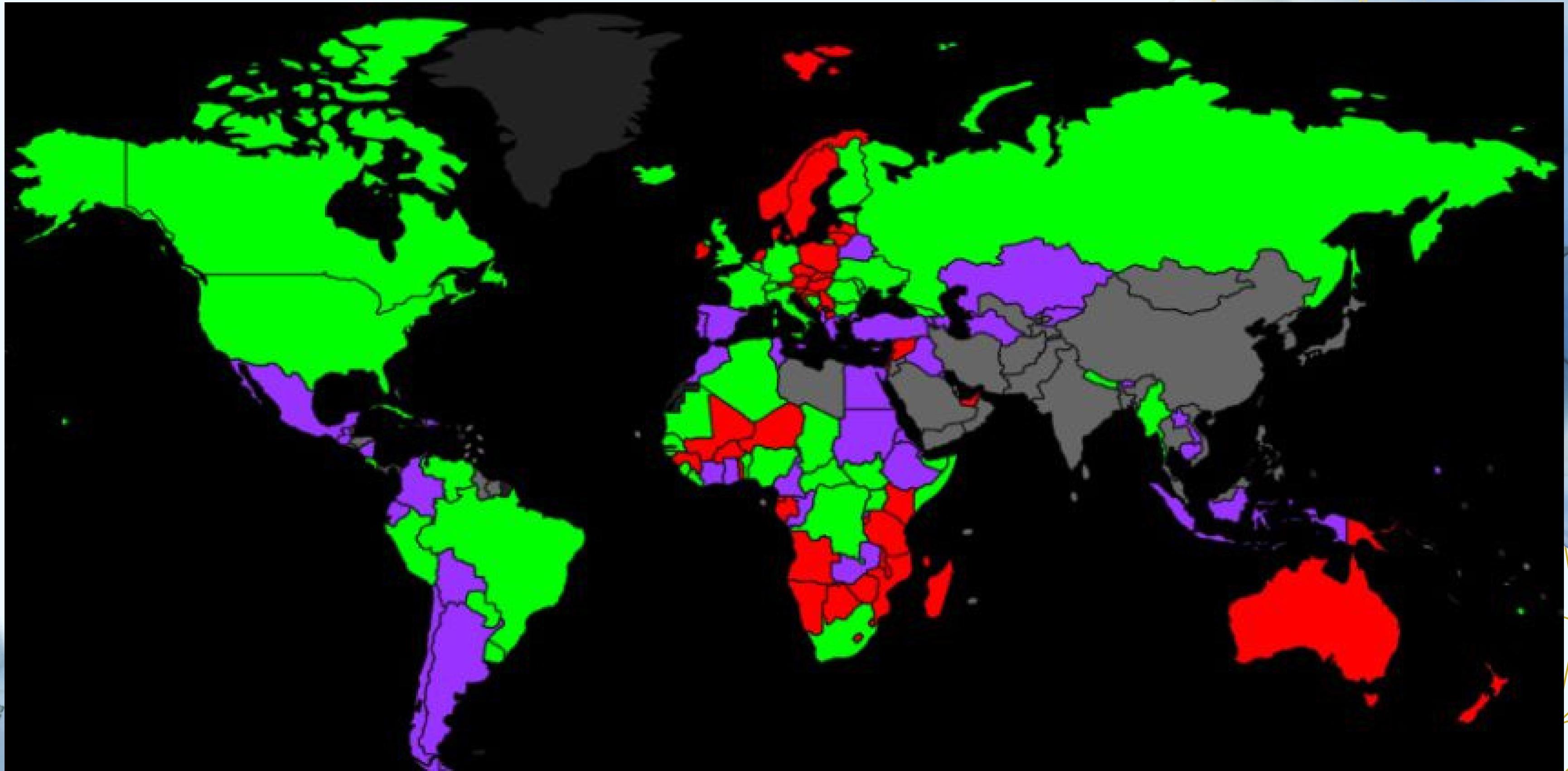
Geographic Location: Living in areas with intense sunlight, high altitudes, or closer to the equator can increase UV exposure and thus the risk of skin cancer.

Exposure to Certain Chemicals: Prolonged exposure to certain chemicals, such as arsenic, can increase the risk of skin cancer.

It's important to take steps to protect your skin from excessive UV radiation, such as using sunscreen, wearing protective clothing, seeking shade, and avoiding tanning beds. Regular skin checks and early detection are also crucial for identifying any suspicious moles or growths and seeking timely medical attention if necessary. If you have concerns about your risk of skin cancer or any suspicious skin changes, it's best to consult a healthcare professional.

Graph

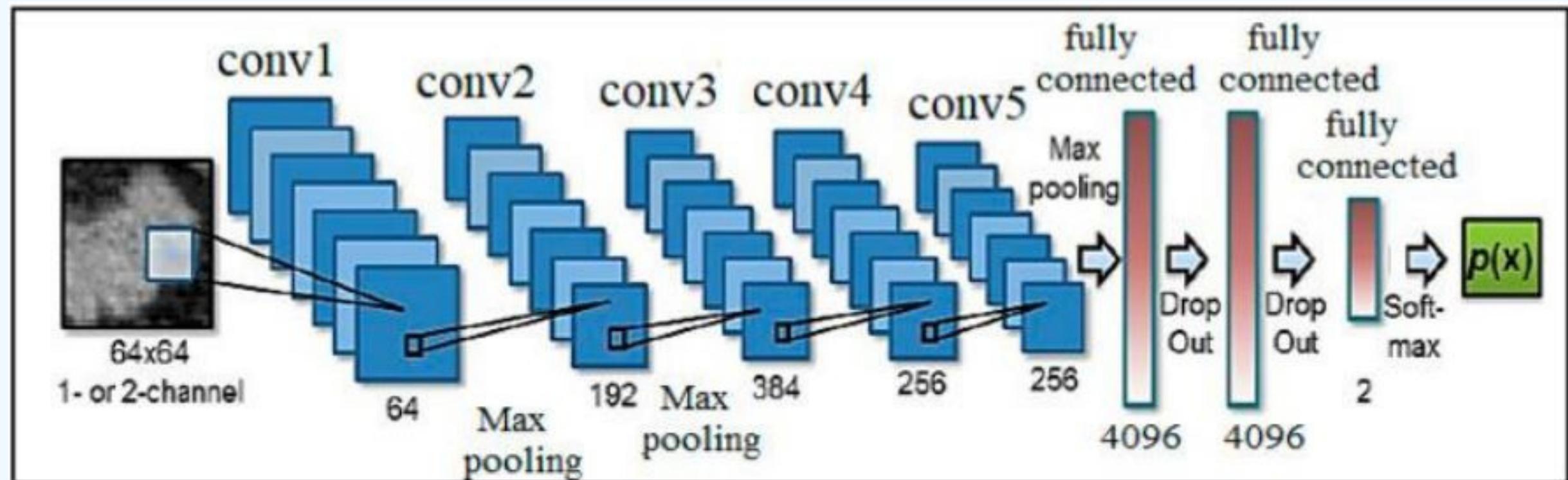




Convolutional Neural Network (CNN)-Based Skin Cancer Detection Techniques

A convolution neural network is an essential type of deep neural network, which is effectively being used in computer vision. It is used for classifying images, assembling a group of input images, and performing image recognition. CNN is a fantastic tool for collecting and learning global data as well as local data by gathering more straightforward features such as curves and edges to produce complex features such as shapes and corners [28]. CNN's hidden layers consist of convolution layers, nonlinear pooling layers, and fully connected layers [29]. CNN can contain multiple convolution layers that are followed by several fully connected layers. Three major types of layers involved in making CNN are convolution layers, pooling layers, and full-connected layers [*

Basic CNN Architecture



Skin Cancer Datasets.

Sr. No	Name of Dataset	Year of Release	No. of Images	Reference Used
1	HAM10000	2018	10,015	[45]
2	PH ²	2013	200	[45]
3	ISIC archive	2016	25,331	[12,33,34,37,44,46,47,48,49,51,53]
4	DermQuest	1999	22,082	[52,63,67]
5	DermIS		6588	[52,63]
6	AtlasDerm	2000	1024	[52]
7	Dermnet	1998	23,000	[52,59]

HAM 10000

There is a human-against-machine dataset with 10,000 training images that is referred to as HAM10000 [66]. It is the latest publicly available skin lesions dataset, and it overcomes the problem of the lack of diversity. The final dataset of HAM10000 contains 10,015 dermoscopic images, collected from two sources: Cliff Rosendahl's skin cancer practice in Queensland, Australia, and the Dermatology Department of the Medical University of Vienna, Austria. This collection has taken twenty years to compile. Before widespread use of digital cameras, photographic prints of lesions were deposited and stored at the Dermatology Department of the Medical University of Vienna, Austria. These photographic prints were digitalized with the help of Nikon-Coolscan-5000-ED scanner, manufactured by Nikon corporation Japan and converted into 8-bit color JPEG images having 300 DPI quality. The images were then manually cropped and saved at 800×600 pixels resolution at 72 DPI.

Advantages of CNN

Efficient image processing

High accuracy rates

Robust to noise, which means that they can still recognize patterns in images even if they are distorted or corrupted.

Do not require human supervision for the task of identifying important features.

Weight sharing, which minimizes computation in comparison with a regular neural network.

Conclusion

Skin cancer detection requires multiple stages, such as preprocessing and image segmentation, followed by feature extraction and classification. This review focused on CNNs, for classification of lesion images. this algorithm has its advantages and disadvantages. Proper selection of the classification technique is the core point for best results. However, CNN gives better results than other types of a neural networks when classifying image data because it is more closely related to computer vision than others.

Since CNN Model helps to find skin cancer more then 90% Perfect

THANK YOU

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