Here Comes the Sun!
The Sun (newspaper) works out the most depressing day of the year

\[
\frac{[W + (D-d)] \times T^Q}{M \times N_A}
\]

W = weather  d = debt  T = time since Christmas
Q = time since failing our New Year's resolutions
M = low motivational levels  Na = low motivational levels
January 15th 2018

“Blue Monday”
Today’s weather
Meanwhile in Sydney:
Get set for a scorcher! Australia to swelter in RECORD heatwave with temperatures soaring to 43C - so how hot is it going to be near you?

http://www.dailymail.co.uk/news/article-5172857/Australia-set-swelter-record-breaking-heatwave.html#ixzz556irhbS6
Advice from Sid the Seagull:
Shirt, Sunscreen, Hat
Australia – skin cancer deaths still rising
What the experts say

How the sun and UV cause cancer | Cancer Research UK

Ultraviolet (UV) Radiation - American Cancer Society

Sun exposure and skin cancer

Skin Cancer Facts & Statistics - SkinCancer.org
Sunlight is dangerous!
Sunlight is dangerous!
But …

What the experts should say
On balance it is really good for you!
(and Scotland tells the story)
The weather is raw and boisterous in winter, shifty and ungenial in summer, and a downright meteorological purgatory in the spring. … Happy the passengers who shake off the dust of Edinburgh, and have heard for the last time the cry of the east wind among her chimney-tops!” (R L Stevenson on his native city).
The haar
Places with more than 25000 people at the latitude of Scotland
40% reduction of UV in Scotland compared to tropics as sun’s rays travel further through the atmosphere
Sunshine hours Europe
UV through the year, Edinburgh, London, Bordeaux
Hours of bright sunshine
Male life expectancy at birth
MALE LIFE EXPECTANCY AT BIRTH

Years

Footnote: Calton, Lenzie both Glasgow (Scotland); Washington DC, Montgomery Co both US

SOURCE: WHO 2008
“The sick man of Europe” [Scotland in red]
... and for the old in Scotland (blue) the gap is getting bigger

Figure 2b: Life expectancy at age 85, UK and constituent countries, 1980-1982 to 2013-2015

Source: Office for National Statistics
Scotland worse for …

Multiple Sclerosis
Cancer
Heart Disease
Rickets
Infectious Disease
Birth Defects
Depression
Suicide
Suicide rates 15-44 years old; Scotland and England
Figure 4. **Sources of vitamin D.**
Ability of whites to synthesise enough Vitamin D through sunlight exposure alone. Yellow - Can synthesise all year round. Pale yellow zone – at least one month a year when cannot synthesise enough. Grey zone – can never synthesise enough from sunlight alone (black, population density).

Nina G. Jablonski, and George Chaplin Phil. Trans. R. Soc. B 2012;367:785-792

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Skye to Marrakesh; dark or light blue – too little UV to make vitamin D
Up to 50% of the adult population in the UK will be vitamin D insufficient during winter and spring with 16% having severe deficiency. In summer and autumn, 28% of adult population in Scotland will be vitamin D insufficient, with 8% having severe deficiency\(^2\)

References
(2) Clinical review, BMJ, Diagnosis and Management of Vitamin D deficiency. Pearce et al 2010
Rapid rise in frequency of light skin allele at 3 loci in Ukraine from 5000 year old fossil DNA compared to modern samples

<table>
<thead>
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<th>Gene</th>
<th>Polymorphism</th>
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<th>Africa</th>
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The palest people
Red Hair Map:
Neanderthal distribution
(Europe much colder then)
Short stretches of Neanderthal haplotypes in Europeans and Asians but not Africans
Ginger, the Neanderthal
Rickets: bones become “flexible like wax that is rather liquid, so that the flabby and toneless legs scarcely sustain the weight of the superimposed body … the back, through the bending of the spine, projects hump fashion in the lumbar region”.

![Images of children with rickets](image1.png)
5000 year old Scot with rickets on Isle of Tiree
Your Britain: fight for it now (1942)
Censored by Churchill: the Finsbury Health Centre, “a disgraceful libel on the conditions prevailing in Great Britain before the war”.

YOUR BRITAIN

FIGHT FOR IT NOW
Finsbury Health Centre: Interior – fresh air and sun room
MÖLLER'S COD-LIVER OIL

Gained the ONLY FIRST PRIZES at the Great Exhibitions of LONDON, PARIS, Etc.

It is not sufficiently considered that the quality of Cod-Liver Oil depends upon the condition of the Fish. The Lofoten Waters in Norway are the only known district where the Cod migrates for spawning, and in excellent condition. Hence the well-known superiority of Lofoten Oil; many reject the light brown on account of its unpleasant taste, arising from its being prepared from putrid livers. PETER MOLLER, therefore, by a Special Process, prepares at Lofoten, a Pale Oil, distinctly different to the Pale Newfoundland, retaining all the curative virtues with a remarkably pure smell and taste.

The late Physician to the North London Consumptive Hospital, Abbott Smith, M.D., M.R.C.P., affirms that Möller's Oil is readily retained by delicate persons, and more efficacious.

The Medical Society of Norway has, through its leading members, testified that Möllers Oil is preferred for its beneficial properties. The Medical Society of Northumberland and Durham pronounced Möller's Oil the best.

Physicians to London Hospitals and other eminent men in the Profession, have certified to its superiority. Dr. L. A. Sayre, Professor of Orthopedic Surgery in Bellevue Hospital Medical College, New York, says: "Of late years it has become almost impossible to get any Cod-Liver Oil that patients can digest, owing to the objectionable mode of procuring and preparing the livers. Möller, of Christiania, Norway, prepares an oil which is perfectly pure, and, in every respect, all that can be wished."—Dr. L. A. Sayre, before Academy of Medicine. See Medical Record, Dec., 1869, p. 447.

Dr. J. Manton Sims says: "For some years I had given up the use of Cod-Liver Oil altogether; but since my attention was called Dr. Sayre to Möller's Oil, I have prescribed it almost daily, and have every reason to be perfectly satisfied with it."

SOLD BY DRUGGISTS.

W. H. Schieffelin & Co., 170 & 172 William Street, New York,
SOLE AGENTS FOR THE UNITED STATES AND CANADAS.
Rickets before and after UV treatment
It does lots of other things too

A summary of causes and consequences of vitamin D deficiency

Causes
- Sun
- Sunscreen
- Melanin
- Latitude
- Winter
- Medications and supplements
  - Antiseizure drugs
  - Glucocorticoids
  - Rifampin
  - Highly active antiretroviral treatment
  - St John's wart
- Malabsorption
  - Crohn's disease
  - Whipple's disease
  - Cystic fibrosis
  - Coeliac disease
  - Liver disease

Vitamin D deficiency
- Schizophrenia
- Depression
- Infections
  - Tuberculosis
  - Influenza
  - Upper respiratory tract infections
- Lung disease
  - Type 2 diabetes
  - Metabolic syndrome
  - Forced expiratory volume in one second
  - Asthma and wheezing diseases
  - Hypertension
  - Cardiovascular disease
- Autoimmune diseases
  - Type 1 diabetes
  - Multiple sclerosis
  - Crohn's disease
  - Rheumatoid arthritis
- Cancer
  - Breast
  - Colon
  - Prostate
  - Pancreas etc

Consequences
- Hepatic failure
- Renal failure
- Nephrotic syndrome
- Obesity
- Muscle weakness
- Muscles aches
- Osteoporosis
- Osteoarthritis
- Osteomalacia (bone pain)
- Pseudofractures
- Rickets

Holick, M. F BMJ 2008;336:1318-1319
The Sun Cure

in Dr. A. Rollier's Clinics
Leysin (Switzerland)

SWISS ALPINE HELIOThERAPIC RESORT  ALT.: 4500 FT
Lupus vulgaris; caused by TB bacillus, cured by sunshine
And viral infections too – darker bars, less vit D, get more infections

*Fig. 2. Prevalence of respiratory infections with 95% prediction intervals in the 25-hydroxyvitamin D categories of <25 nmol/l (■), 25–49.9 nmol/l (■), 50–74.9 nmol/l (■), 75–99.9 nmol/l (■) and >100 nmol/l (■) as predicted from a logistic regression model adjusted for factors of lifestyle, socio-economic position and adiposity, and season in the 1958 British birth cohort.*
And even cancer ...
Breast Cancer versus Latitude

Incidence rates of prostate and breast cancers in different countries as functions of the mean latitude of the country.

Johan Moan et al. PNAS 2008;105:668-673
Incidence Rates of Type I Diabetes in 51 Regions
World Health Organization

$R^2 = 0.25$
$p < 0.001$
Prevalence of Multiple Sclerosis per 100,000 population. Strong fit with sunlight (and hence with Vitamin D) even in Europe alone; a five-fold difference in rate from place to place.
Deaths from cardiovascular disease, cancer and other causes in 55-64 yo Swedish women in relation to sun exposure
Effect on 50yo life expectancy if smoking eliminated
Vitamin D deficiency in UK children 2000-2015: 15x increase
England: Increase in rickets over 50 years
African albino
An overview analysis of the time people spend outdoors
Then and now: the New Club, Princes Street, 1963
The PhD student 1969
Reduction in Scottish snow and frost 1970-2010
Temperature increase forecast to 2080 under three scenarios
A sunny day in 1930s Edinburgh
Joseph Goebbels 1938: “Edinburgh will make a delightful summer capital when we invade Britain”.