

# PRIMAL HEALTH RESEARCH

A NEW ERA IN HEALTH RESEARCH

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## SEASONALITY OF BIRTH

### IS THERE A LINK BETWEEN PRIMAL HEALTH RESEARCH AND ASTROLOGY?

Our health is to great extent shaped during the 'primal period' (which goes from conception until the first birthday). This was the main conclusion of 'Primal Health', a book written in the mid-1980s.<sup>1</sup> This conclusion was based on theoretical considerations rather than on hard data that were not yet available. At that time we could just anticipate that all environmental factors and all events occurring during the period when our basic adaptive systems (those involved in what we commonly call health) are reaching their maturity should have life long consequences. With the progress of information technology and the use of computers, it was also possible to anticipate that the development of the new branch of 'epidemiology' that we call 'primal health research' would support our theoretical basis. This framework includes all studies exploring correlations between what happened during the primal period and what will happen later on in life in terms of health and behaviour.

During the past twenty years 'Primal Health Research' developed at such a speed that in the mid 1990s I found it necessary to establish and to constantly update the 'Primal Health Research Data Bank'.

### A productive keyword.

In 2005, among the hundreds of keywords our database can offer, some lead to a great number of studies. This is the case of 'seasonality of birth'. It confirms the determinant effects of environmental factors during the primal period. It seems obvious that the prenatal and early postnatal environments are related to the season of birth. In many societies the food consumed by pregnant women and lactating mothers is highly influenced by the season. The risks of having certain viral diseases (e.g. the flu) are undoubtedly higher during certain months. The ambient temperatures, and therefore the activities of the thermoregulatory systems, fluctuate according to the rhythm of the seasons. Furthermore we learnt recently about the light-dark sensitivity of the pineal gland. The release of its hormone melatonin occurs mostly in the dark at night, and is therefore related to the comparative durations of days and nights. In general there are seasonal variation in hormonal balances. For example higher levels of testosterone in spring compared to autumn have been reported in females.

It is also predictable that the long-term effects of the month of birth are dependent on the place of birth. The hemisphere (North or South) and the latitude should be taken into consideration.

An overview of the database reveals the great diversity of entries that are accessed via the keyword 'seasonality of birth'. It makes clear that the time and place of birth have effects on the main characteristics of a human being. Among the characteristics that have already been studied from this perspective, we found lifespan, height, degree of fecundity, learning abilities, handedness, psychological traits and proneness to particular diseases.

### Life expectancy

An authoritative German enquiry, by the demographic researchers of the Max Planck Institute, was based on population data with more than a million observations.<sup>2</sup> In two countries of the Northern Hemisphere (Austria and Denmark) people born in autumn (October-December) live longer than those born in spring (April-June). Data from Australia show that, in the Southern Hemisphere, the pattern is shifted by half a year. The lifespan pattern of British immigrants to Australia is similar to that of Austrians and Danes and significantly different from that of Australians. The differences are independent of the seasonal distribution of deaths and the social differences in the seasonal distribution of births. In the Northern Hemisphere, the excess mortality in the first year of life of infants born in spring does not support the explanation of selective infant survival. Instead, remaining life expectancy at age 50 appears to depend on factors that arise during the primal period. Interestingly, differences in adult lifespan by month of birth decrease over time and are significantly smaller in more recent cohorts.

Such data were confirmed and completed by another German study. Data from 188,515 people who died in North Rhine in 1984 and from 188,850 who died in 1999 were analysed.<sup>3</sup> For comparative purposes, all deaths that occurred before the age of 50 were excluded. In general, individuals born in May through July had the lowest age at death while those born between October and December had the highest, supporting earlier

findings. The observed differences between highest and lowest values were more significant in men than in women. This was confirmed by separate analyses by gender, possible for the data from Germany, the Ukraine, and the USA. The effects of the month of birth are more pronounced for men.

If life expectancy is influenced by the month of birth, one can assume that the seasonal variations in food consumption provide one of the possible explanations. That is why it is useful to analyze data from countries where the seasonal variations of foods available are enormous. This is the case of rural Gambia, where the wet season (July-October) coincides with an annual hungry period where staple foods from the previous harvest are seriously depleted. During the hungry period the average birth weight is reduced by 200-300 grammes, and the incidence of low birth weight babies is doubled. An analysis of births and deaths in 3 Gambian villages provided data on month of birth for 3,102 individuals born in 1949 and after.<sup>4</sup> The most interesting finding is that at an early age deaths were similar in groups born between January and June and between July and December. But, from the age of 15, the rate of premature death was multiplied by 3.65 among those born between July and December, and at the age of 35 the rate of death was multiplied by 10.4. These deaths were related to a great variety of causes, including maternal deaths.

### Other personality traits

The most authoritative study relating body height and month of birth used a population of 507,125 Austrian male subjects born over 10 years.<sup>5</sup> Body height was evaluated at age 18 on birth month. The main result is that average height of those born during spring is 0.6 cm higher than the average height of those born in Autumn. Not only is there a difference between the 'January to June' and the 'June to December' cohorts, but also a sinusoidal fluctuation over the year. The authors compared this fluctuation with the monthly variation in sunshine duration in Austria during the same interval.

Handedness is an important personality trait, since all human beings develop a dominant hand. We studied handedness from a primal health research perspective in our summer 1998 newsletter.<sup>6</sup> We could accumulate a sufficient amount of data to conclude that handedness is to a great extent determined during fetal life. But, at that time, the data provided by a team from Melbourne about seasonality of birth and laterality was not yet available. The Melbourne study examined the proposition that hand preference may change with season of birth in a group of 523 students born in southern Australia.<sup>7</sup> Hand preference and performance measures revealed a greater number of left handed students among individuals born in winter and autumn compared to summer and spring. These seasonal effects tended to be more pronounced for females compared to males. The authors mentioned that similar seasonal patterns had been observed in the northern hemisphere.

Today, thanks to the use of different personality and temperament "inventories", it is becoming commonplace to investigate the psychological traits of children and adults. A Japanese team looked at the effects of season of birth in 397 healthy Japanese adults.<sup>8</sup> They used the "NEO Personality Inventory-Revised". A trend for lower "agreeableness" in subjects born during winter (December to February) than other subjects was observed. The differences were statistically significant. A Swedish team had previously analyzed

the "Temperament and Character Inventory" for 2,130 individuals taking part in the Betula prospective random cohort study of Umea.<sup>9</sup> It appeared that women born during February to April were significantly more likely than those born during October to January to have high "Novelty Seeking", particularly in terms of impulsiveness versus reflection, while men born during the same months had a higher "Persistence".

Learning abilities cannot be dissociated from personality traits. According to the *concordant conclusions of several studies, those born in summer have significantly lower average learning abilities.*<sup>10,11,12</sup> A recent large study looked at children born during each season in one geographical area of the State of Georgia (USA) served by 28 school districts. 'Standardized achievement scores' in reading, mathematics, and science were reliably lower for those born in summer. Furthermore, there was a strong relationship between season of birth and the rate at which children received a diagnosis of 'specific learning disabilities'. These results are not in contradiction with the results of studies looking at the date of birth of medical students. Among the medical students in Porto, Portugal, a significantly higher incidence of them were born before summer, during the second trimester of the year.<sup>13</sup> The authors underlined that students entering Portuguese medical schools are among the most successful high school students. Similar results were provided in Florence, Italy, among medical students selected after the numerus clausus introduced during the 1988-89 academic year.<sup>14</sup>

*The influence of the month or season of birth on human 'fecundability' is probable but difficult to demonstrate among contemporary populations in the age of effective and widespread methods of birth control. This influence appeared significant in a pre-modern Canadian population<sup>15</sup>, and also in the 19<sup>th</sup> century Dutch population. Dutch women who married between 1802 and 1829 were more at risk of remaining childless if they were born in January or July. Those who were born in September had the greatest number of children.<sup>16</sup> Among 800 women born between 1873 and 1887 in or near Rotterdam, the peaks of 'reproductive failures' were among those born either January 1<sup>st</sup> and February 11 or between July first and August 11.<sup>17</sup> In order to examine whether the effect of birth date is also valid in contemporary women, an Austrian team investigated the association between birth month and measures of 'reproductive performance' (number of live-born children and percentage of childless individuals) in a representative sample of contemporary women.<sup>18</sup> They found that, on average, women born in summer months have fewer children than women born during the remainder of the year. No significant association between birth month and the percentage of childless individuals was found. In a separate study the same team found that men born in autumn had fewer offspring and a higher probability of remaining childless than men born in spring.<sup>19</sup>*

Still in the field of human reproduction, let us mention the use of a population-based historical French Canadian database to examine the effects of mother's birth season on sex ratio at birth (the comparative number of boys and girls) during the 18<sup>th</sup> century.<sup>20</sup> Mother's birth season was the single most significant factor influencing the sex ratio. Mothers born in February-April gave birth to a comparatively small number of boys (sex ratio: 1.013). In contrast, season of father's birth did not affect the sex ratio.

## Proneness to diseases

Most studies exploring the influence of the month or the season of birth on the incidence of particular diseases are very recent. Their results should open the way to further research.

A large American study found a relationship between month of birth and the incidence of two varieties of adult brain tumors (glioma and meningioma), with peaks in February and January and troughs in August and July.<sup>21</sup> The association between month of birth and risk of glioma differed significantly by handedness, with left-handed and ambidextrous subjects born during late fall through early spring being at particularly high risk of adult glioma as compared with those born at other times of the year. The same team of researchers had previously revealed that persons who described themselves as left-handed or ambidextrous appeared to be at reduced risk of glioma relative to those who described themselves as right-handed. The association was similar for men and women, and for left-sided and right-sided tumors.<sup>22</sup>

The risk of multiple sclerosis (MS) in relation to the month of birth is also well documented. The most authoritative enquiry involved 17 874 Canadian patients and 11 502 British patients with multiple sclerosis.<sup>23</sup> In Canada, significantly fewer patients with MS were born in November compared with controls from the population census and unaffected siblings. These observations were confirmed in the dataset of British patients, in which there was also an increased risk among those born in May. Furthermore, a pooled analysis of datasets from Canada, Great Britain, Denmark, and Sweden showed that significantly fewer (8.5%) people with MS were born in November and significantly more (9.1%) were born in May. The effect of month of birth was most evident in Scotland, where MS prevalence is the highest. The data provided by this large enquiry confirm previous findings in Northern countries.<sup>24, 25, 26</sup> Interestingly, a different pattern of MS patients' births is observed in Sicily, a country with a paradoxically high incidence of MS, in spite of its Mediterranean latitude. In Sicily, the distribution of births among MS patients compared with the general population was no different when tested with the usual statistical methods (the chi 2 statistics). By using a more specific test (The Hewitt's non-parametric test for seasonality<sup>27</sup>) the researchers could however demonstrate an excess of births between June and November among MS patients.<sup>27</sup>

The Scottish, Yorkshire, and British Paediatric Association registers contained respectively 2258, 1142, and 1265 patients with childhood diabetes type 1 (insulin dependent) born during 1974-88. For each register the monthly pattern of births differed significantly from that in the general population.<sup>28</sup> For each register more patients were born during the spring and early summer and fewer during the winter months compared with the general population. Further studies across European populations (by the 'Eurobiab Seasonality Of Birth' Group) found no uniform seasonal pattern of birth in childhood diabetes patients.<sup>29</sup>

According to an enquiry involving 4286 British women aged 60 to 79, being born during the cold months is associated with increased risk of coronary heart disease, insulin resistance, dyslipidaemia, and poor lung function. This research has not been repeated.<sup>30</sup>

As for the risks of dying from cerebrovascular diseases in relation to month of birth, our data base includes a large Japanese study involving 853 981 people born in the years 1900-1959. It appears that, in Japan, the risk of dying from subarachnoid haemorrhage is more than 10% higher among those born in the summer (June to September).<sup>31</sup>

As early as 1989, a British enquiry found a significant excess of births during the first three months of the year in Alzheimer's patients without a family history of dementia.<sup>32</sup> These data were not contradicted by a study in Quebec, that showed a significant deficit of births in the month of May,<sup>33</sup> and by a study in Minnesota, which found a peak period during the first three months of the year for female patients.<sup>34</sup> It is noticeable that an Australian study could not find any link between the season of birth and the risk of Alzheimer's disease in the Southern hemisphere.<sup>35</sup>

It is still difficult to classify the results of studies exploring substance abuse in relation to the month of birth. A sophisticated study analyzed the half years of birth among 113,276 alcoholic patients in the U.S. Army Alcohol and Drug Abuse Prevention and Control Program from 1986 through 1990.<sup>36</sup> They compared the 17-21 year old and the 22-39 year old age groups. Both groups differed significantly from the normal circannual birth pattern, but in opposite directions. The findings support the differentiation of types of alcoholics by age, which is a characteristic of Cloninger's classification. An interview-based study of 42,862 American men and women provided data to assess the association between quarter year of birth and lifetime diagnoses of substance abuse.<sup>37</sup> It revealed decreases in winter births in men with histories of alcohol dependence and an excess of births in autumn among male but not female alcoholics. Men and women with histories of illicit drug use had excesses of birth in autumn. The similar birth patterns of illicit drug users and male alcoholics suggest that they may share some common etiological factor. These patterns contrast with those found among psychotic patients.

### The particular case of schizophrenia

The number of studies relating the keywords 'seasonality of birth' and 'schizophrenia' is impressive. It is also noticeable that many of these studies preceded the development of the branch of epidemiology we call 'primal health research'. In the late 1960s and the early 1970s it was already clear that there was in the Northern hemisphere a significant excess for winter/spring births among schizophrenic patients.<sup>38,39</sup> This is confirmed today by an overview of the medical literature.<sup>40 to 59</sup> It appears also that the quarterly birth distribution of patients with schizophrenia is reversed in the Southern hemisphere,<sup>41,42,50,58</sup> and that the season-of-birth effects are difficult to demonstrate in tropical and equatorial countries.<sup>49,52,57</sup> According to recent studies, 'deficit schizophrenia' has a season of birth pattern that differs from that of nondeficit schizophrenia.<sup>43,46,51</sup> Deficit schizophrenia is defined with respect to the lack of positive symptoms, when a person has mainly negative symptoms (lack of emotions, lack of pleasure, etc.): it is a severe form of the illness. This analysis supports the notion of a separate disease within schizophrenia. Similarly, the keyword 'seasonality of birth' leads to the notion of a separate disease within eating disorders. The first quarter peak seasonal patterns may imply links between aetiology of early-onset eating disorders and psychosis, while a June birth peak was found in the study of later-onset eating disorders.<sup>60</sup>

## The future

Tindan?

The keyword 'seasonality of birth' is so productive that we should expect more research exploring links between the date of birth and a great variety of personality traits, states of health and diseases. Some studies might be inspired by animal experiments. For example the scoliosis of chickens whose pineal gland has been removed is prevented by injections of melatonin: what about the risk of human scoliosis in relation to the month of birth? We should expect also a proliferation of theoretical interpretations of hard data provided by epidemiologists. While in some cases one factor associated with the season is obviously involved (for example the risk of premature death in Gambia in relation to poor maternal nutrition during the wet season) in other cases several interpretations may be offered and discussed.

Many theoretical interpretations will probably refer to the activity of the pineal gland and the release of melatonin, since this hormone, which has wide-ranging interactions with growth factors, is also a mediator of immune functions and an effective free radical scavenger. Because we live in a world illuminated artificially, it is plausible that the season-of-birth effects are decreasing. It is noticeable, in particular, that human neonates are routinely exposed to powerful lights that can cause a reduction in melatonin production during a critical period of development. We must add that today the activities of our thermoregulatory systems are not highly influenced by the seasons, since we rely on effective heating and air conditioning, even when moving in a car. In the age of supermarkets, we can consume a great variety of food all the year round. The risks of viral infections, on the other hand, remain highly influenced by the seasons.

Our physician-astrologer predecessors would just claim that we cannot modify the positions of the planets...

Michel Odent

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