

February 1, 2018

## INVESTMENT COMMENTARY

RESMED INC. (NYSE: RMD)

### OBESITY IS PRIME VILLAIN IN THE PROLIFERATION OF CARDIOVASCULAR DISEASE, DIABETES, STROKE, DEPRESSION, AND SLEEP APNEA

On January 22, 2018, ResMed reported that its revenue for the second quarter ended December 31, 2017 accelerated to \$601.3 million, a thirteen per cent increase when compared to the second quarter ended December 31, 2016.

ResMed and Respironics, a division of Phillips Electronics, enjoy a global duopoly in the manufacture and marketing of CPAP (continuous positive airway pressure) machines, machines made to get sleep apnea under control. (Sleep apnea is a condition in which breathing and hence blood oxygenation is compromised, yielding a poor night's sleep. The severity of sleep apnea is measured by the number of breathing interruptions that occur per hour, with any number five or less permissible or not dangerous. Many people suffer many multiples of the safe level before treatment with a CPAP machine.)

The treatment of sleep apnea represents a huge commercial opportunity. In the United States, for example, health experts estimate that twenty-two million people suffer from sleep apnea, and many of these twenty-two million are not only untreated, but unaware that sleep apnea afflicts them.

The powerful jump in ResMed's 2017 second quarter revenue, in fact, reflects the spread of worldwide obesity and ResMed's efforts to make the medical community and the larger public aware of obesity's multidimensional comorbid dynamic. Sleep apnea is often a misfortune that obesity produces, thus sleep apnea is said to have a comorbid relationship with obesity.

Worldwide obesity is nothing new. Suggestions of what would become a major world health crisis began to appear in the 1980s, mostly notably in the United States. Here is a culture that values convenience, quick access, and instantaneous

gratification, a culture that indulges in fast-cooked, quickly-delivered food, a culture that is in love with such hard-to-resist items as the enticing French fries that accompany that seductive celebration of saturated fat and cholesterol, the hamburger known affectionately as the Big Mac. Such a culture is almost guaranteed to fall into the viselike grip of obesity and its comorbid afflictions such as sleep apnea. (Weight gain or obesity makes it difficult for the muscles that govern the movement of the throat to keep the throat open wide enough to get the proper amount of airflow for sleep.)

Today, the problem of worldwide obesity is much more entrenched than it was in the 1980s. Meera Senthilingam, writing for CNN on June 12, 2017, delved into the dismal and darkening global obesity picture:

#### **One-third of world now overweight, with US leading the way**

More than 2 billion adults and children globally are overweight or obese and suffer health problems because of their weight, a new study reports.

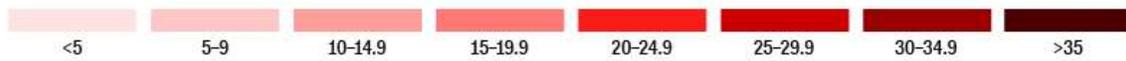
This equates to one-third of the world's population carrying excess weight, fueled by urbanization, poor diets and reduced physical activity.

The United States has the greatest percentage of obese children and young adults, at 13%, while Egypt led in terms of adult obesity, with almost 35%, among the 195 countries and territories included in the study.

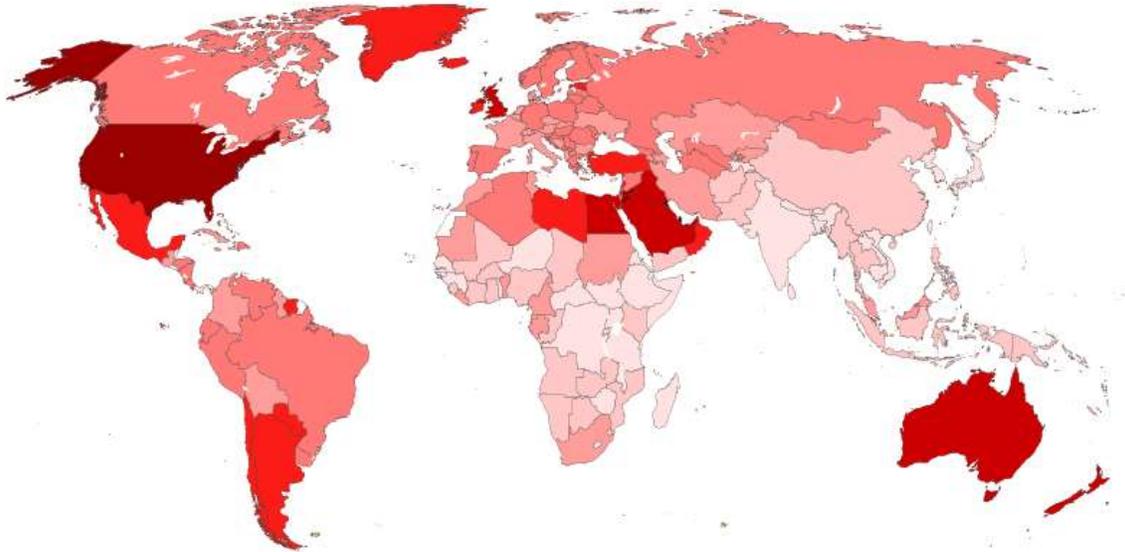
While 2.2 billion people were obese or overweight in 2015, more than 710

# Global obesity

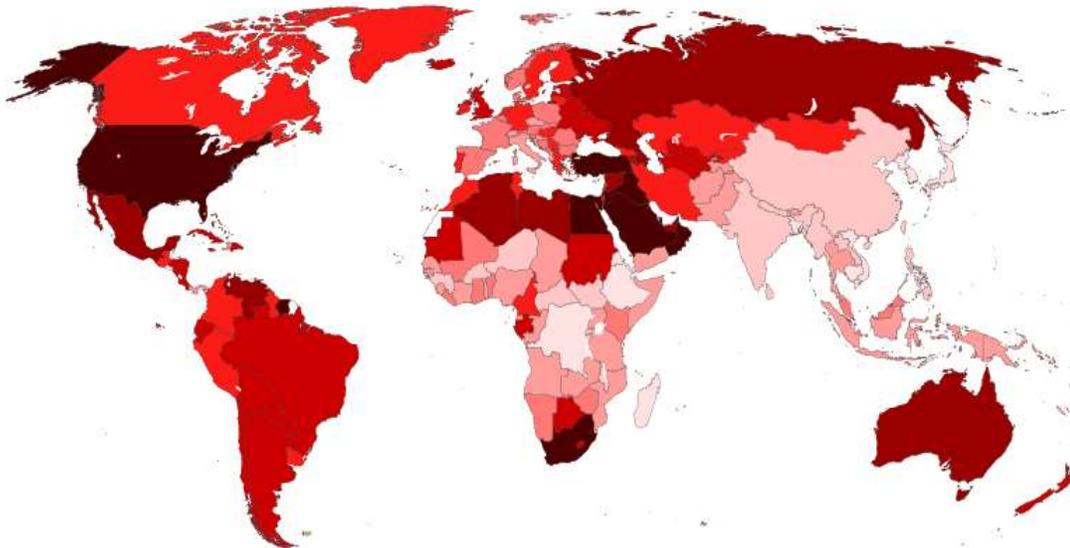
Percentage of population



Adult men



Adult women



 Source: The New England Journal of Medicine

million of them were classed as obese, with 5% of all children and 12% of adults fitting into this category.

An increasing number globally are dying from health problems linked to being overweight, such as cardiovascular disease, said the study, published

Monday in the New England Journal of Medicine.

Almost 40% of the 4 million dying as a result of their higher body mass index were not yet obese, highlighting that deaths are occurring almost as often in

those considered overweight as those considered obese.

Body mass index is the ratio between a person's weight and height; a BMI of 25 to 29.9 is considered overweight, while anything over 30 is obese.

"Those half-serious New Year's resolutions to lose weight should become year-round commitments to lose weight and prevent future weight gain," he said in a statement.

### **The global obesity picture**

The researchers analyzed data from 68.5 million people between 1980 and 2015 to explore trends as well as figures regarding overweight and obesity rates.

Data were obtained from the most recent Global Burden of Disease study, which explores all major diseases, conditions and injuries globally by age, sex and population.

The data revealed that the number of people affected by obesity has doubled since 1980 in 73 countries, and continued to rise across most other countries included in the analysis.

Obesity levels were higher among women than men across all age groups, which correlates with previous findings on obesity.

Percentages of children who were obese were lower than adults, but the rate at which their numbers have increased was greater, signifying more risk in the future if nothing is done to curb the problem.

In terms of numbers, the large population sizes of China and India meant they had the highest numbers of obese children, with 15.3 million and 14.4 million, respectively.

"People who shrug off weight gain do so at their own risk—risk of cardiovascular disease, diabetes, cancer, and other life-threatening conditions," said Dr. Christopher Murray, director of the Institute for Health Metrics and Evaluation at the University of Washington, who worked on the study. Despite a smaller population, the United States had the greatest number of obese adults, with 79.4 million (35% of the population), followed by China with 57.3 million.

The lowest obesity rates were seen in Bangladesh and Vietnam, at 1%.

"This re-emphasizes what we already know about the obesity epidemic," said Goodarz Danaei, assistant professor of global health at the Harvard T.H. Chan School of Public Health. "But it raises the alarm that we may be facing a wave of obesity in the coming years across high- and low-income countries."

Danaei believes that while the epidemic may have plateaued in terms of growth among certain adult populations, such as the US population, the greater rate of change among children means there will be a future cohort of people who have been exposed to a high BMI for a longer period of time, which researchers will not have faced before.

"We don't really know what the long-term effects will be if exposed to high BMI over 20, 30, 40 years," said Danaei, who was not involved in the study. "It may be larger than we have already seen."

### **A rise and fall in numbers affected by disease**

In recent years, while rates of cardiovascular disease have risen, the number of deaths have fallen. The researchers believe this may in large part be due to better clinical interventions becoming available, such as measures to

# THE WALL STREET JOURNAL.

Wednesday, January 24, 2018

## Percentage Gainers...

Company	Symbol	Latest Session			52-Week		
		Close	Net chg	% chg	High	Low	% chg
vTv Therapeutics CIA	VTVT	7.59	1.68	<b>28.43</b>	8.09	3.57	<b>32.5</b>
Revolution Lighting Techs	RVLT	4.15	0.83	<b>25.00</b>	9.17	2.95	<b>-34.4</b>
Inovio Pharmaceuticals	INO	5.69	1.05	<b>22.63</b>	9.86	4.09	<b>-8.1</b>
ACM Research CIA	ACMR	5.66	0.91	<b>19.16</b>	8.48	4.74	<b>...</b>
Helios Matheson Analy	HMNY	9.77	1.50	<b>18.14</b>	38.86	2.20	<b>177.6</b>
Zymeworks	ZYME	11.85	1.81	<b>17.98</b>	14.25	6.25	<b>...</b>
Forward Industries	FORD	2.92	0.43	<b>17.27</b>	4.45	1.02	<b>133.6</b>
VivoPower International	VVPR	2.55	0.34	<b>15.26</b>	5.33	2.08	<b>-50.8</b>
GenMark Diagnostics	GNMK	5.78	0.75	<b>14.91</b>	13.67	3.63	<b>-53.6</b>
CRISPR Therapeutics	CRSP	38.78	5.03	<b>14.90</b>	39.19	11.63	<b>104.6</b>
ResMed	RMD	100.35	12.84	<b>14.67</b>	104.78	66.18	<b>43.9</b>
Dawson Geophysical	DWSN	6.94	0.88	<b>14.52</b>	8.55	3.70	<b>-14.5</b>
Rocket Pharmaceuticals	RCKT	15.19	1.92	<b>14.47</b>	16.00	3.40	<b>149.0</b>
Dicerna Pharmaceuticals	DRNA	10.94	1.37	<b>14.32</b>	11.19	2.42	<b>305.2</b>
Fossil Group	FOSL	10.78	1.31	<b>13.83</b>	26.78	5.50	<b>-58.2</b>

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control high blood pressure, cholesterol and blood sugar levels, which all fuel heart disease.

This is the case in countries like the United States, argues Danaei, adding that prevention services leading up to the onset of cardiovascular disease, such as blood sugar monitoring, or care after a heart attack, or stroke, have improved in developed countries.

But these services are expensive and are not currently the norm in most low- and middle-income countries. "After a heart attack, the chance of dying is much higher in developing countries," he said.

### Why is this happening?

Obesity levels have risen in all countries, irrespective of their income level, meaning the issue is not simply down to wealth, the authors say in the paper.

"Changes in the food environment and food systems are probably major drivers," they write. "Increased availability, accessibility, and affordability of energy dense foods, along with intense marketing of such foods, could explain excess energy

intake and weight gain among different populations."

They add that reduced levels and opportunities for physical activity that came with increased urbanization are also potential causes, but add that these are "unlikely to be major contributors."

"We need to control the consequences of obesity much better globally ... and help people who are obese to lose weight," Danaei said. "That's where we need research and public health interventions."

People afflicted with **sleep apnea** do not get enough sleep, and therefore may crave sweets and other unhealthful foods, a dynamic that leads to obesity, completing a vicious and insidiously destructive physiological and psychological cycle imprisoning the sufferer.

Sleep is not a luxury or a discretionary activity—it is vital to survival. If sleep is compromised, the body is compromised and is more vulnerable to obesity and its inevitable comorbid events, such as cardiovascular disease, diabetes, stroke, and, of course, **sleep apnea**.

When **ResMed** reported strong earnings for the quarter ended December 31, 2017, it became

## How exactly does the CPAP (Continuous Positive Airway Pressure) machine work?

During CPAP treatment, a patient sleeps with a nasal interface connected to a small portable air device that delivers room air at a positive pressure. The patient breathes in air from the device and breathes out through an exhaust port in the interface. Continuous air pressure applied in this manner acts as a pneumatic splint to keep the upper airway open and unobstructed. Interfaces include nasal masks and nasal pillows. Sometimes, when a patient leaks air through their mouth, a full-face mask may need to be used, rather than a nasal interface. (ResMed Form 10- K for the fiscal year ended June 30, 2017, page 4)

evident that the recognition of the need to fight **sleep apnea** is taking shape in the investment world, just as the importance of dealing with diabetes began to coalesce about 1980. If I am correct, there is a large long-term capital gain for ResMed shareholders in the years ahead.

What is especially promising for ResMed is the following:

We are focused on the sleep and related respiratory care markets, both of which we believe are globally underpenetrated markets, and where we believe our products can improve patient outcomes, create efficiencies for our customers, help physicians and providers better manage chronic disease and reduce overall healthcare system costs. (ResMed Form 10- K for the fiscal year ended June 30, 2017, page 2)

If you are unlucky enough to have **sleep apnea**, it's very likely that you have cardiovascular problems and other health problems. If there is a way, an inexpensive and simple way, to combat **sleep apnea**, as ResMed does with its CPAP machines, you are also going to improve the other health issues that play a comorbid role with **sleep apnea**. That makes the treatment of **sleep apnea** not only a highly desirable priority for the patient, but also for health care organizations and insurance companies such as Medicare, because such insurance entities will spend less money on other issues if they solve the **sleep apnea** problem.

A strong association has been discovered between obstructive **sleep apnea** and a number of cardiovascular and metabolic diseases. Studies have shown that sleep disordered breathing is present in approximately 83% of

patients with drug-resistant hypertension, approximately 72% of patients with type 2 diabetes, approximately 77% of patients with obesity and approximately 76% of patients with chronic heart failure.

Sleep fragmentation and the loss of the deeper levels of sleep caused by obstructive **sleep apnea** can lead to excessive daytime sleepiness, reduced cognitive function, including memory loss and lack of concentration, depression and irritability. Obstructive **sleep apnea** sufferers also experience an increase in heart rate and an elevation of blood pressure during the cycle of apneas. Several studies indicate that the oxygen desaturation, increased heart rate and elevated blood pressure caused by obstructive **sleep apnea** may be associated with increased risk of cardiovascular morbidity and mortality due to angina, stroke and heart attack.

Patients with obstructive **sleep apnea** have been shown to have impaired daytime performance in a variety of cognitive functions including problem solving, response speed and visual motor coordination, and studies have linked obstructive **sleep apnea** to increased occurrences of traffic and workplace accidents. (ResMed Form 10- K for the fiscal year ended June 30, 2017, page 3 to 4)

### Increase Public and Clinical Awareness.

We continue to expand our existing promotional activities to increase

awareness of sleep disordered breathing, chronic obstructive pulmonary disease and other clinical conditions that can be treated with our industry-leading solutions. These promotional activities target both the population predisposed to sleep disordered breathing and medical specialists, such as pulmonologists, sleep medicine specialists, primary care physicians, cardiologists, neurologists and other medical subspecialists who treat these conditions and their associated comorbidities. In the last year we launched SleepScore Labs, a joint venture between ResMed, Dr. Mehmet Oz and Pegasus Capital to help consumers better understand and improve their sleep.

We also target special interest groups, including the National Stroke Association, the American Heart Association and the National Sleep Foundation, to further increase awareness of the relationship between sleep disordered breathing or obstructive sleep apnea, chronic obstructive pulmonary disease, neuromuscular disease and comorbidities such as cardiac disease, diabetes, hypertension and obesity. The programs also support our efforts to inform the community of the dangers of sleep apnea with regard to occupational health and safety, especially in the transport industry.

We have helped establish a center for clinical care and medical research at the University of California at San Diego in the fields of sleep apnea and chronic obstructive pulmonary disease and we established a pair of perpetual academic chairs at the University of Sydney, called the ResMed Chair of Sleep Medicine for sleep-disordered breathing with a focus on chronic disease and the ResMed Chair of Biomedical Engineering with an emphasis on bio-informatics research. (ResMed Form 10-K for the fiscal year ended June 30, 2017, page 8)

Sincerely,



Fredric E. Russell  
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This INVESTMENT COMMENTARY is not a recommendation of purchase nor does it purport to offer advice regarding the purchase or sale of any security or industry sector.

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Clients and employees (through taxable and tax-deferred accounts, including the Fredric E. Russell Investment Management Co. 401(k) Plan and other accounts controlled by Fredric E. Russell) own, as of January 24, 2018, 50,800 shares of ResMed Inc. (NYSE: RMD).

We may liquidate, decrease, or increase our position in ResMed at any time, without notice before or after we do so. This letter is not a recommendation of purchase or other action.

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For further information, please contact Bruce Clemens email at [bwc@ferimc.com](mailto:bwc@ferimc.com) or call him at 918.743.5959.

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Katie Michaels-Johnson and Ying Qi made important research contributions to this investment letter and commentary.

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### Fredric E. Russell: Brief Authorized Biography

Fredric E. Russell graduated from Deerfield Academy in Deerfield, MA and then earned a B.A. from [Swarthmore College](#) in Swarthmore, PA and an M.A. from [Washington University](#) in St. Louis, MO. He also holds the CPA certificate and taught accounting and finance at the university level, before realizing that he could make real money for himself and for people he knew using some of the analytical qualities that the studying and teaching of accounting and finance demanded.

Consequently, he retired from academic life, which he enjoyed tremendously and which gave him everything he needed, except a comfortable amount of cash and marketable securities and the freedom to write [INVESTMENT COMMENTARIES](#) in a manner he thought would be informative and entertaining for the clients of the investment management firm he always wanted to have.

We believe that our [INVESTMENT COMMENTARIES](#) are an indispensable part of our engagement with our clients, giving them an understanding of what we think is important in our investment decisions.

In these letters, I attempt to tell the story of a company—what it does, how it makes money, and what its competitive advantages are—to give our clients and others an understanding of our investment approach.

There is no schedule for these letters. I write them when I am excited and inspired. I do not believe that we ought to spend time on delivering something just because other firms deliver something at a conventional time and in a conventional format.

Therefore, you may not see any year-end review, and if so that is because I believe that often there is nothing to add that is exceptional when compared to all the year-end reviews you might see elsewhere, which are the conventional method that investment firms use to communicate with clients, forecasting market developments such as employment figures and interest rates. We have no special skills in that arena and therefore I believe there is no point in bombarding our clients with information that is available from many sources

for free, if you do not consider the energy and time one uses to wade through this information. Our focus will continue to be understanding a small group of companies, with an attempt to analyze this group with more acuity than the competition.