



Healthcare Industry Update

Thursday, February 15th, 2018



THE ORIGIN RX

Healthcare is getting an intervention

Healthcare systems are a complex web of government, patients, providers, hospitals, insurers and drug companies. Resulting global healthcare costs are gigantic, worth a total of \$17trn in 2015 and making up, on average, 10% of a country's GDP (The Economist Feb 3, 2018). The US spends 17% of their GDP on healthcare, a disproportionate amount. US public sector spending is in line with comparable countries (surprising given their loathing of public healthcare), but at 8.8% of GDP, the US private sector healthcare spend is nearly triple that of other countries (Kaiser Family Foundation Analysis of data from OECD 2017.) Small wonder Warren Buffet referred to healthcare costs as "a hungry tapeworm on the US economy."

Clearly there is huge motivation for corporate titans to turn their attention to healthcare and try to disrupt the market. Walmart and Caterpillar have tried for years, but politics has gotten in the way. IBM, Berkshire's BNSF Railway and American Express were founding members of the Health Transformation Alliance, which now includes about 40 big companies that want to transform health care and have partnered with existing industry players like CVS and UnitedHealth Group Inc.'s OptumRx. Smartphones are looking like the game-changer, creating a perfect entry point for the titans of tech. Smartphones enable each of us to manage our purchasing, banking, and even healthcare from anywhere, anytime.

Amazon, Berkshire Hathaway and JP Morgan announced on January 30, 2018 that "...they were partnering on ways to address healthcare for their US employees, with the aim of improving employee satisfaction and reducing costs." There are no details on the venture yet, but there is much speculation around what will be delivered through this new distribution channel to a combined one million employees and their families, including: leveraging Amazon's logistics to sell drugs online, using Amazon's data-processing power to build patient monitoring tools outside of a hospital or clinic, developing a doc-booking app, and increasing purchasing power. Whatever the resulting tools, you can bet they will be rolled out to the broader population.

There are more cloak & dagger healthcare projects in development at all the tech giants. Apple is leveraging their hardware platform, building secure devices for communication of medical data and the foundation for third party apps. The iPhone iOS 11.3 beta update will put patients at the centre of their own data, allowing them to view, manage and share their medical records from a dozen initial participating hospitals in the US. Fast forward and envision the possibility of smartphones and wearables that can monitor blood pressure or sugar levels or provide connectivity for deeper clinical trial insights.

Alphabet/Google initiatives include: DeepMind Health, a UK-based AI company improving quality of care; Calico to extend human lifespans; Verily, applying AI and analytics for more holistic care management; and, Cityblock Health, serving American urban Medicare/Medicaid patients who have generally gone without good healthcare services. Facebook, the social media giant needing to show its platform can be used for good and not evil, could monetise patient groups by recruiting and managing clinical trials and offering higher level insights for drug development companies. Microsoft is working on wearables and software.

The FDA has already begun an overhaul of its approach to regulating digital health technology, including a precertification pilot program in partnership with 9 companies: Apple, Fitbit, J&J, Pear Therapeutics, Phosphorous, Roche, Samsung, Tidepool and Verily. These companies clearly have significant interest in marketing their devices and wearables as class II medical devices which can make healthcare claims.

Given the size of healthcare expenditures, we aren't surprised to see new players finding a way to tap into it. Add to that US private sector payers feeling the pain. The result is a commitment to developing insights and tools to cut healthcare costs without negatively affecting quality of care and outcomes. The track records, knowledge base and scale of these tech companies could dramatically change healthcare delivery, provided they have our trust. I think we'd better get used to the idea; digital healthcare is already in the palm of your hand.

CATHY STEINER, PRINCIPAL





BIGGEST MOVERS

Recent News¹

The first half of February has been volatile, with the TSX dropping 4% and the Nasdaq also dropping 4%. It's been a mixed bag in healthcare subsectors, which follow in this report. A summary of the largest share price movers in the healthcare space during the recent period is included below:

- **Array BioPharma Inc.** (NasdaqGM:ARRY, **+22%**): Shares climbed in the early part of February 2018 driven by the release of positive results from its Columbus Phase 3 trials. Associated with ongoing encorafenib drug therapy for BRAF-mutant melanoma patients, the Phase 3 trials saw drastic improvement in victim median overall survival rates versus leading treatments with vemurafenib.
- **Aquinox Pharmaceuticals, Inc.** (NasdaqGM:AQXP, **+19%**): Aquinox is a clinical-stage pharmaceutical company discovering and developing novel drug candidates to treat inflammation, inflammatory pain, and blood cancers and is based in Castle Rock, Colorado. Recent strong performance has been driven by the announcement on February 9th, 2018 that it has met its enrollment threshold of 300 females in its LEADERSHIP 301 clinical trial of rosiptor (AQX-1125) in interstitial cystitis/bladder pain syndrome (IC/BPS) and remains on track for topline data in the third quarter of 2018.
- **ImmunoGen Inc.** (NasdaqGS:IMGN, **+18%**): is a clinical stage biotechnology company utilizing antibody-drug conjugates (ADCs) in the development of anticancer therapeutics. Strong recent performance was driven by recent positive news of the trials in its pipeline, notably activating 100 sites enabling rapid patient enrollment in the ongoing Phase 3 Forward I trials of mirvetuximab soravtansine, as well as strong operating performance and position.
- **Aimmune Therapeutics, Inc.** (NasdaqGS:AIMT, **13%**): Aimmune is a clinical-stage biopharmaceutical company and it develops and commercializes product candidates for the treatment of peanut and other food allergies in the United States and Europe. Shares performed well of late due to the announcement of positive results from its Oral L6, Poster #722, Poster #820, Poster #751 trials.
- **Owens & Minor, Inc.** (NYSE:OMI, **-23%**): Owens & Minor is a global healthcare solutions company providing supply chain services to healthcare providers and manufacturers of healthcare products. Recent share performance has been driven by release of poor operating performance for 2017 and negatively adjusted 2018 earnings estimates.
- **Corcept Therapeutics Incorporated** (NasdaqCM:CORT, **-32%**): Corcept is a pharmaceutical company that discovers, develops, and commercializes drugs for the treatment of severe metabolic, oncologic, and psychiatric disorders in the United States. Recent share performance has been driven by release of poor operating performance for 2017 and negatively adjusted 2018 earnings estimates.

Note 1: For the period February 1st to February 15th, 2018

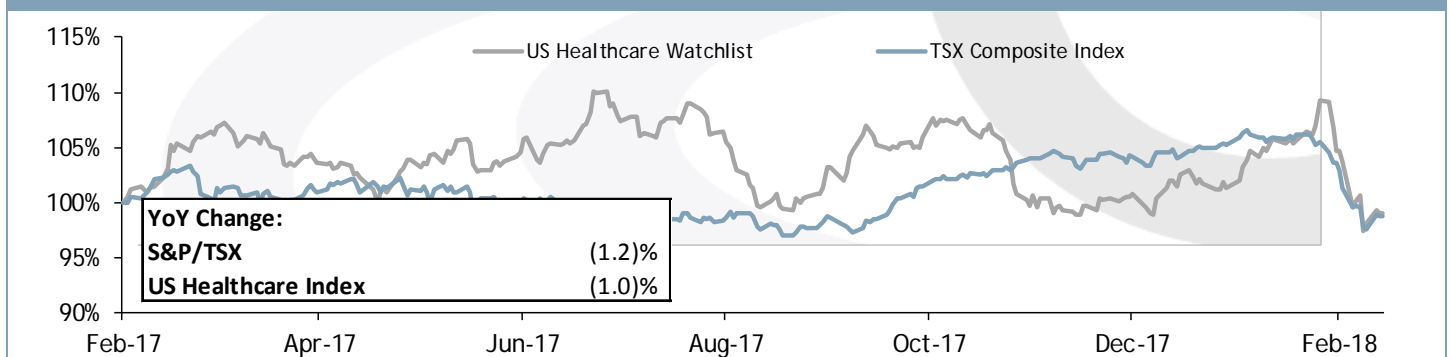


US HEALTHCARE WATCHLIST

News Scan¹

- Last twelve-month performance of the US Healthcare Watchlist index was approximately -1%, matching the TSX Composite Index which also lost 1% over the same period. Some events making news this February:
- On Feb. 1st, **Novartis Groupe France S.A.**, a subsidiary of **Novartis AG**, announced the completion of the subsequent offering period of its tender offer to purchase all outstanding shares of **Advanced Accelerator Applications S.A.** As of the expiration of the subsequent offering period, 95,127,753 ordinary shares were validly tendered, representing approximately 98.7% of all outstanding ordinary shares and a purchase price of US\$3.9 billion. The transaction will be funded through external short and long-term debt. Integration of Advanced Accelerator Applications will build on Novartis' expertise in diseases associated with NETs and introduce a new technology platform to Novartis providing an innovative approach to treating cancer
- On Jan. 29th, **AstraZeneca PLC** announced it will acquire the respiratory preparations portfolio from **Takeda Pharmaceutical Company Limited**, for an undisclosed amount. As part of the transaction, AstraZeneca will acquire the portfolio of all respiratory products made by Takeda. The transaction is expected to close in the first quarter of 2018
- On Feb. 7th, **Allergan PLC** announced it will acquire **Elastagen Pty Ltd.**, a clinical stage company developing medical device products based on recombinant tropoelastin, for an upfront payment of US\$95 million plus contingent, commercial payments
- On Feb. 1st, **CVC Capital Partners Limited** announced it acquired a portfolio of products from the Specialty Global Women's Health business of **Teva Pharmaceutical Industries Limited**, for approximately \$US703 million in cash. The purpose of Teva's planned divestment of specialty products in women's health is to generate cash in order to repay term debt. Teva has generated US\$2.48 billion from the women's health divestitures
- On Feb. 2nd **Merck KgaA** announced that **Nestlé** was no longer pursuing the roughly €4 billion acquisition of its consumer health unit, maker of Seven Seas vitamins. Nestlé, along with **Glaxo SmithKline** and **Reckitt Benckiser** are said to be contenders to buy Pfizer's €16 billion consumer health business, maker of Advil, Centrum multivitamins and Chapstick lip balm. J&J has confirmed that they are no longer interested in the Pfizer unit

Relative Performance Index



Note 1: For the period February 1st to February 15th, 2018

US Healthcare Watchlist Constituents: Johnson & Johnson, Pfizer Inc., Roche Holding AG, Novartis AG, Merck & Co., Inc., AbbVie Inc., Amgen Inc., Medtronic plc, Gilead Sciences, Inc., Bayer AG, Abbott Laboratories, Bristol-Myers Squibb, GlaxoSmithKline plc, Eli Lilly and Company, AstraZeneca PLC, Celgene Corporation, Allergan plc, Boston Scientific Corporation, Mylan N.V., Teva Pharmaceutical Industries, Mallinckrodt Public Limited Company, Endo International plc

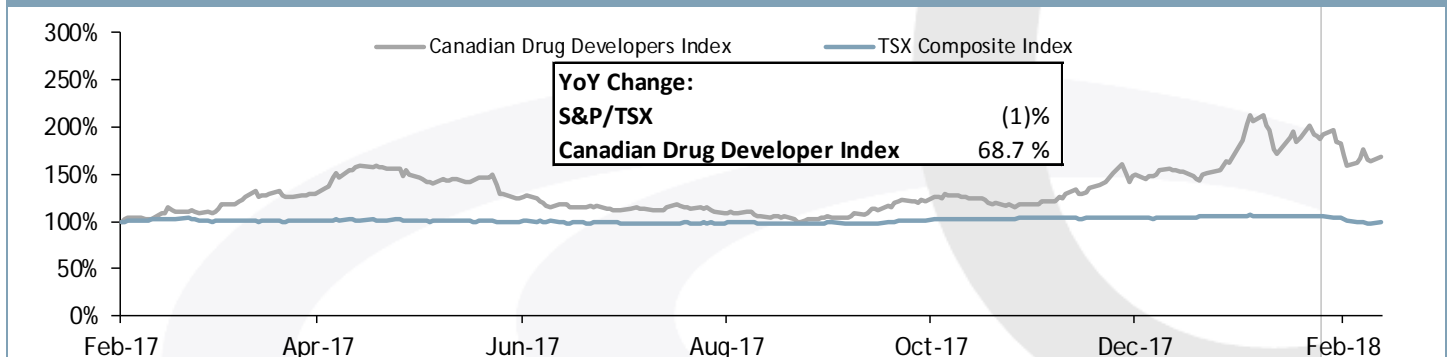


CANADIAN DRUG DEVELOPERS

News Scan¹

- Last twelve-month performance of the Canadian Drug Developer index was an impressive 69%, significantly outperforming the TSX Composite Index which lost 1% over the same period. In the news February 2018:
- On Feb. 8th, **Arbutus Biopharma Corp.**, a Hepatitis B Virus (HBV) therapeutic solutions company, announced a site consolidation and organizational restructuring to better align its HBV business in Warminster, PA. Arbutus will reduce its global workforce by approximately 31 percent and close its Burnaby facility. The restructuring will cost approximately \$5.0 million, which will be primarily paid in cash, and is expected to result in increased efficiency, a more flexible variable cost structure, and additional preservation of the company's cash reserves
- On Feb. 4th, **Tetra Bio-Pharma Inc.**, a developer of bio pharmaceuticals and natural health products, announced it has received a No Objection Letter (NOL) from the Therapeutic Products Directorate (TPD) Health Canada to its Clinical trial application (CTA) for the Company's PPP001 prescription smokable dried cannabis product. Tetra is now ready to initiate its Phase 3 clinical trial of PPP001 in terminal cancer patients, the first registration trial in the world for smokable cannabinoid-based drug
- On Feb. 12, **Neptune Technologies & Bioresources Inc.**, a nutrition products company that focuses on specialty ingredients and consumer brands, and **Tetra Bio-Pharma Inc.** announced they entered into an agreement for the co-development, commercialization and marketing of purified cannabinoid oil-based products to address pain and inflammation relief applications for the natural health products and pet veterinary markets

Relative Performance Index



Note 1: For the period February 1st to February 15th, 2018

Canadian Drug Developers Constituents: ProMetic Life Sciences Inc., Clementia Pharmaceuticals Inc., Aurinia, Pharmaceuticals Inc., Arbutus Biopharma Corporation, Resverlogix Corp., Aquinox Pharmaceuticals, Inc., Zymeworks Inc., ImmunoVaccine Inc., InMed Pharmaceuticals Inc., Sierra Oncology, Inc., Tetra Bio-Pharma Inc., Oncolytics Biotech Inc., Cardiome Pharma Corp., Acerus, Pharmaceuticals Corporation, ProMIS Neurosciences Inc., Aeterna Zentaris Inc., Trillium Therapeutics Inc.

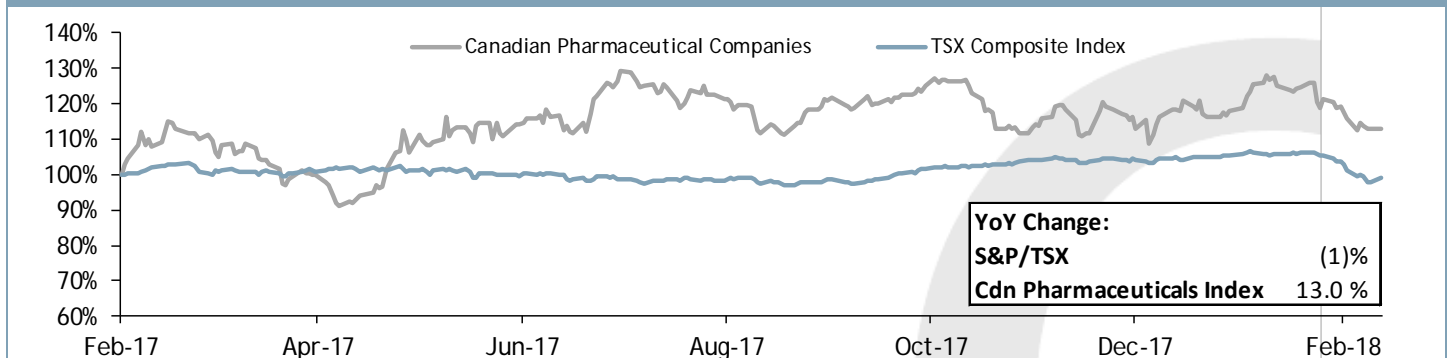


CANADIAN PHARMACEUTICALS

News Scan¹

- The Canadian Pharmaceutical index gained approximately 13% over the last twelve months, beating the TSX Composite Index which lost 1% over the same period. News for Canadian-listed pharmaceutical companies in February 2018:
- On Feb. 1st, **Delivra Corp.**, a speciality biotechnology company, announced it signed a non-exclusive distribution agreement with **NKS Health Ltd.** Through the agreement, HKS will have the right to compound, distribute, promote, market and sell new pharmaceutical compounded product formulas developed by Delivra. The goal of the distribution agreement is to build a partnership which will grow awareness and increase sales volume for Delivra's pharmaceutical pipeline

Relative Performance Index



Note 1: For the period February 1st to February 15th, 2018

Canadian Pharmaceuticals Constituents: Valeant Pharmaceuticals International, Inc., Knight Therapeutics Inc., Concordia International Corp., Aralez Pharmaceuticals Inc., Theratechnologies Inc., Zomedica Pharmaceuticals Corp.

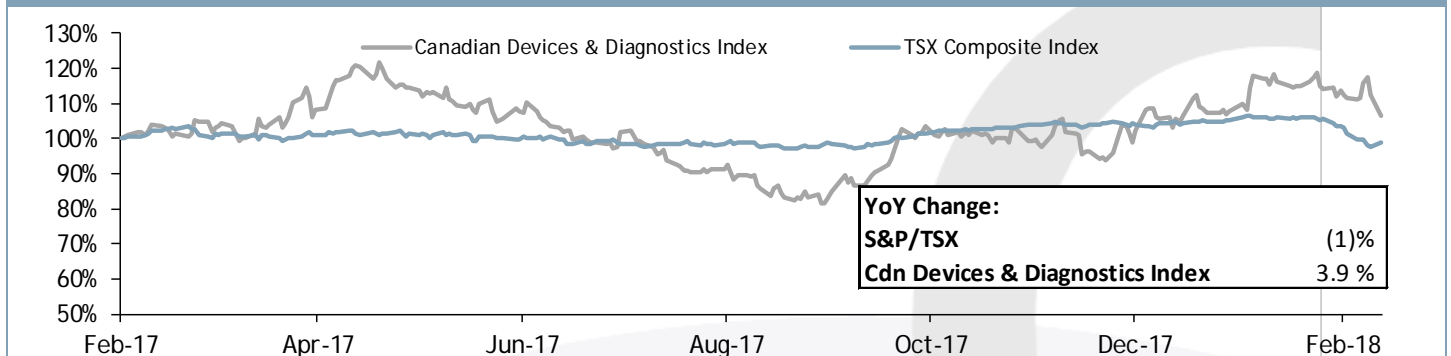


CANADIAN DEVICES & DIAGNOSTICS

News Scan¹

- The Canadian Devices & Diagnostics index increased by approximately 4% over the last twelve months, lagging the TSX Composite Index which lost 1% over the same period. Newsmakers for February 2018:
- On Feb. 1st, **Neovasc Inc.** announced that the German Institute for the Hospital Remuneration System (InEK) awarded its Neovasc Reducer, a medical device for refractory angina treatment, NUB status 1 for 2018. InEK, is responsible for prioritizing new therapies in Germany, and upgraded the status of the Neovasc Reducer from status 4 to status 1 - the highest priority designation available. The NUB process opens the path for negotiations between hospitals and health insurance companies on the reimbursement of new medical treatments in the German system

Relative Performance Index



Note 1: For the period February 1st to February 15th, 2018

Canadian Devices and Diagnostics Constituents: CRH Medical Corporation, TSO3 Inc., Titan Medical Inc., Opsens Inc., Neovasc Inc., ChroMedX Corp., Profound Medical Corp., Covalon Technologies Ltd., Spectral Medical Inc.

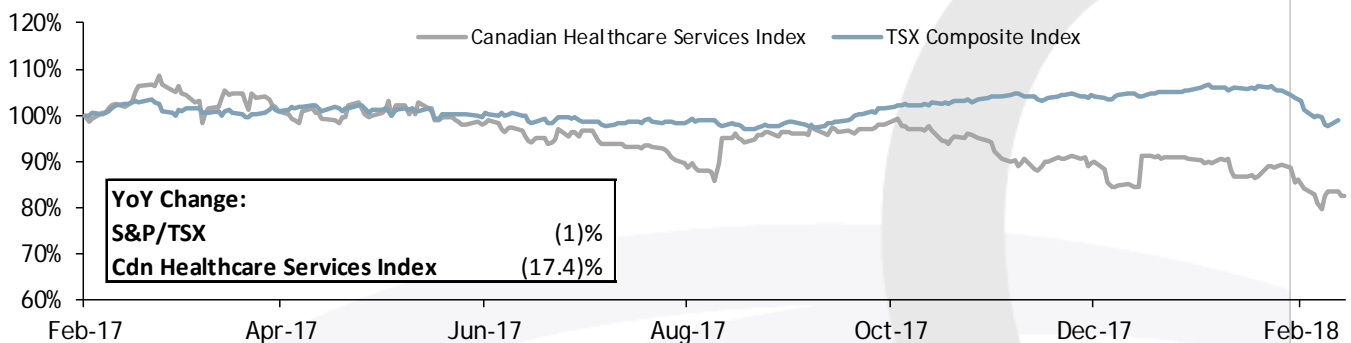


CANADIAN HEALTHCARE SERVICES

News Scan¹

- The Canadian Healthcare Services index experienced a decline of approximately 17% over the last twelve months, lagging the TSX Composite Index which lost 1% over the same period. February 2018 news highlights among the group:
- On Feb. 1st, **Medical Facilities Corp.**, an owner-operator of speciality surgical hospitals, announced it completed the acquisition of seven ambulatory surgery centers from **Meridian Surgical Partners** through a joint-venture with **NueHealth LLC** for US\$46.5 million. Medical Facilities owns 94.25% of the joint venture, and the joint venture owns approximately 53% of the equity interest in the centers. NuHealth will be responsible for providing day-to-day management and operations support to the centers
- On Feb. 9th, **Akumin Inc.**, a provider of outpatient diagnostic imaging services in the US, announced certain senior offers and directors of the company acquired approximately 1.4% of Akumin for US\$1.865 million. The shares were acquired pursuant to a previous exercise of a call option by **Z Strategies Inc.**, a corporation controlled by Riadh Zine, the President and CEO of the Akumin

Relative Performance Index



Note 1: For the period February 1st to February 15th, 2018

Canadian Healthcare Services Constituents: Sienna Senior Living Inc., Extencicare Inc., Medical Facilities Corporation, Akumin Inc, Centric Health Corporation

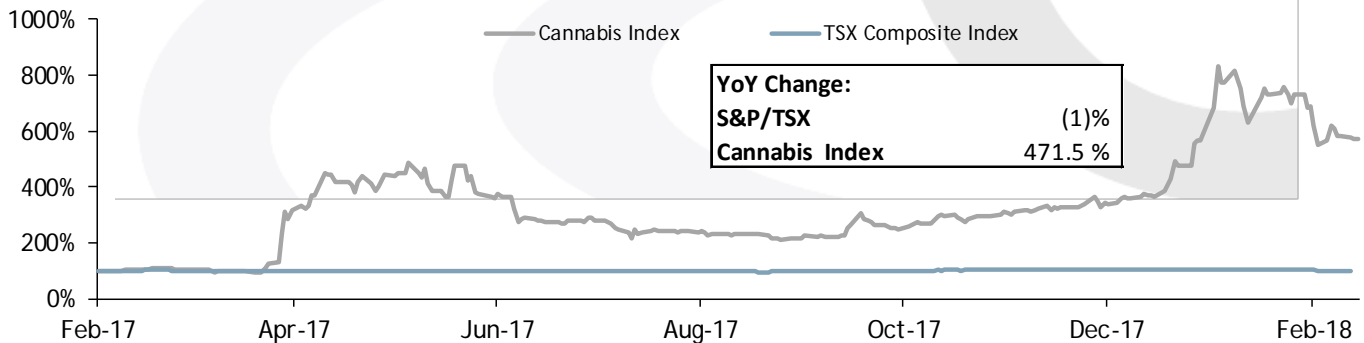


CANNABIS

News Scan¹

- Last twelve-month performance of the Canadian Pharmaceutical index was approximately 472%, dwarfing the 1% loss of the TSX Composite Index over the same period. Highlights of cannabis news for February 2018:
- On Feb. 5th, **Aurora Cannabis Inc.** announced it will acquire up to 40% of **Liquor Stores N.A. Ltd.** by way of a non-brokered private placement. The placement will be structured in two phases, with Aurora making an initial investment of C\$103.5 million for approximately 19.9% ownership of Liquor Stores. Aurora will purchase 6.9 million common shares at a price of \$15.00, representing a 24% premium to the five-day average trading price. The company hopes to take advantage of Liquor Store’s distribution network and experience in the retail of adult use-controlled products to establish a leading private retail footprint in the cannabis sector
- On Feb. 2nd, **Liberty Health Sciences Inc.**, an investor and operator in the US medical cannabis market, announced it will acquire **Aphria (Arizona) Inc.**, a subsidiary of **Aphria Inc.**, for \$C20 million. The transaction includes the acquisition of minority membership interests in Copperstate Farms LLC and Copperstate Farms Investors LLC held by Aphria (Arizona). Aphria’s decision to sell its subsidiary comes as part of the company’s continued efforts to work collaboratively with the TSX and Canadian securities regulatory authorities regarding the divestiture of direct investments in the US cannabis sector
- On Jan. 29th, **Aphria Inc.** announced it will acquire the remaining 93.5% stake in **Nuuvera Inc.** for C\$610 million, pursuant to which Aphria will own 100% of the issued and outstanding common shares of the company. The transaction values Nuuvera at approximately C\$826 million. Nuuvera shareholders will receive \$1.00 in cash plus 0.3546 of an Aphria share for each Nuuvera share. Aphria expects to issue up to 34 million shares in connection with the transaction. The acquisition brings an already successful partnership between Aphria and Nuuvera under the Aphria brand, reducing costs and providing the potential to unlock greater economic value from future production.
- On Feb. 12th, **Organigram Holdings Inc.** announced it received an expanded cultivation license from Health Canada related to its previously announced Phase 2 expansion. The scope of the amendment includes the approval of an expanded facility, the first 10 of Organigram’s new 23 three-level cultivation rooms and improved functional design to facilitate production. Organigram claims the expansion will triple production capacity, lower cost of production and improve yields

Relative Performance Index



Note 1: For the period February 1st to February 15th, 2018

Cannabis Index Constituents: Canopy Growth Corporation, Aurora Cannabis Inc., Aphria Inc., MedReleaf Corp., CannTrust Holdings Inc., CanniMed Therapeutics Inc., Cannabis Wheaton Income Corp., Organigram Holdings Inc., The Supreme Cannabis Company, Inc., The Hydropharmacy Corporation



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