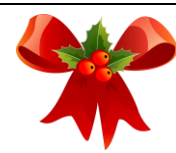




Newsletter



Volume 16, Issue 10.5

Special Holiday Edition 2016

Message from the President – Bernie Fontaine

Happy holidays to all. The November dinner meeting was joint meeting with our colleagues from the Mid-Atlantic Biological Safety Association (MABSA) and the presentations were enjoyed by more than 50 attendees. The before-dinner meeting speakers, Aparupa Sengupta, Ph.D. (Biosafety Officer) and Thomas Block, MPH CIH (Health and Safety Specialist) from Rutgers University spoke about the many challenges faced and conquered while implementing the plant biosafety management system in the agricultural research farms and addressing and managing the occupational health issues faced by agricultural workers. The after-dinner meeting speaker, Rob Brauch from Lantos Technologies spoke about the ongoing changes in the field of hearing conservation along with the rapid rate development of new technological developments in collaboration with using the Internet of Things (IoT), Big Data, and the capacity to do more - simpler, faster, and with smarter applications.

We recently concluded two other planned events – four Professional Development Courses (PDCs) were held at the PSE&G facility in South Plainfield, NJ and the 70th annual Northeast Industrial Hygiene Conference and Exposition (NEIHce) was held at the Westin Forrestal Village in Princeton, NJ. Both events required carefully planning, coordination, and marketing. I want to thank everyone for coming to these venues but more importantly, I want to personally thank all of the members of NJAIHA Planning Committee for their dedication and support for both successful outcomes. Both Barbara Woodhull (Chair, NEIHce Committee) and Mark Ostapczuk (Chair, PDC Committee) provided inspiration, guidance and leadership for these events. This special December issue of the newsletter provides our members with a recap of the outstanding speakers and their engaging presentations. (see photos on pages 10-17)

So far, this have been such a wonderful and extraordinary year. Now that these events are concluded, NJAIHA looks forward to the upcoming months by continuing our journey set forth in the 2016-2017 Action Plan. Our next mission is to examine ways to collaborate with stakeholders to promote NJAIHA across boundaries for greater recognition and understanding for the work that we do to protect worker health. We look for the NJAIHA membership to help support this initiative by volunteering your time, providing suggestions and/or comments, and collaborating with our trusted Executive Committee.

Our profession is expanding in so many ways that were unimaginable only a few years ago. Industrial hygienists now have a broader application of human talent to work with other professional disciplines in the construct of important management decisions that affect workers' lives, their families, community and the environment. The NIOSH Total Worker Health program is only one step toward this goal. We are asking the NJAIHA membership to volunteer their time to help our leadership construct a robust plan and reach out to the business community to discuss our mission and vision. Our objective is to provide greater awareness of what we do and the support that can be given toward research and development to the strategic management planning goals. We can affect change by understanding our role and talking about impact of decisions will have on the economy, society, and governance. Our human talent within NJAIHA is boundless and it is important that we talk about what we can do to make NJ a better place to live. Hence, I am asking anyone who wishes to venture down this trail, contact Craig Doolittle to work on this committee. This is a multi-year engagement and your full support is needed for a successful outcome.

NJAIHA needs to do more to seek more Outreach Coordinators from the NJAIHA membership to promote industrial hygiene and/or occupational health in the school districts as a career choice and to teach school administrators and faculty about how they can protect students entering the workforce for the first time. Tools on the NJAIHA website that can be downloaded and used in a 45-minute stand down. NJAIHA is focused on reaching out to high school students that maybe working part-time jobs or seeking summer employment. Other students may be entering the workforce to learn a trade and need to understand the hazards on their job. The NJ Youth@Work Talking Safety is a unique program that has been vetted to meet NJ child labor law requirements. Recently NJAIHA has included a similar training and education program for intellectually and developmentally disabled students. If you want to become involved and present to school districts, teachers' unions, and teacher or school administrator associations; please contact Candice Kowalewski.

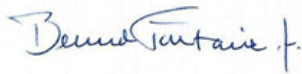
We are continuing to work hard to find outstanding speakers and emerging topics of interest for the monthly dinner meetings! If you have an idea for either a speaker or topic, contact Craig Doolittle. As a side bar, NJAIHA offers a **"Loyalty Rewards Program"** for members who attend any five (5) dinner meetings. In addition, if you can sign-up five (5) new or former members in our **"Member Get-a-Member"** program, NJAIHA will offer you a free dinner. So far, we have increased our membership with this incentive. So, let's keep the process going strong. Our organizational strength comes from our membership. We must continue the process of engaging and empowering more people to join.

As a reminder, we need your continued financial **support for the student scholarships**. We need to encourage students to consider this profession as a career choice or enhance their knowledge of the principles and practice of industrial hygiene. We are selling the piqué polo shirts with the NJAIHA logo to raise revenue to support these annual student scholarships. We are holding our pricing so that more members of NJAIHA can afford purchasing these shirts. These shirts can be proudly worn to any NJAIHA venue and they make a great holiday gift. If you would like to make a purchase, contact Craig Doolittle or visit the NJAIHA website for details. Limited quantities/sizes will be available for purchase at the upcoming monthly dinner meetings.

Over the past several months, you may have noticed more communication by email and our monthly newsletter contains much more information than previous years. Our goal is to keep the membership informed of emerging events and to become more proactive to disseminate timely information. We also want to engage the membership in the mission and vision of NJAIHA. If you would like to share any information with the NJAIHA membership such as job postings, new equipment and technology, informational resources, business case study, and/or professional events, contact Mark Ostapczuk.

In closing, we have selected a stellar lineup of speakers for 19 Jan 2017 monthly dinner meeting. I hope to see you and a friend at Snuffy's! Look for the upcoming email announcement and/or posting on LinkedIn and Facebook.

Best regards,



Bernard L. Fontaine, Jr., CIH, CSP, FAIHA

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Visit NJAIHA On-line

NJAIHA is continuously posting relevant information on industrial hygiene principles and practice on these webpages. Feel free to find out current events which may affect your business or industry and continue the conversation on a regional, national, and international level.

<http://www.facebook.com/pages/American-Industrial-Hygiene-Association-New-Jersey-Local-Section/139640922751121>

<http://www.linkedin.com/groups?mostPopular=&gid=3675325>

OUR LOCAL SECTION OFFICERS

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President-Elect	Craig Doolittle	973-670-9793	CDoolittle@trcsolutions.com
Treasurer	Barbara Woodhull	732-225-6040	barb.woodhull@us.bureauveritas.com
Secretary	Henry Shotwell	908-310-8481	dr.hank@mindspring.com
Past-President	Mark Ostapczuk	201-783-6621	mark.ostapczuk@roche.com
Director: Member Services	Candice Kowalewski	732-695-4880	cakowalewski@msn.com
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Director: Publications	Mark Ostapczuk	201-783-6621	mark.ostapczuk@roche.com
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Web Master	Jack Zybura	973-560-0090	jzybura@lsga.com
Historian	Tim Rice	908-782-2102	ricehss@comcast.net

Membership Rewards

Members remember our ongoing loyalty rewards program. After five (5) paid dinner meetings, dinner is on us!! Please pick-up your loyalty reward card and have it checked at the door. This is a great way to help us increase the membership at the dinner meetings.

Another way to earn loyalty rewards points, sign up five (5) of more new or former members of NJ AIHA. All new members are tracked to ensure that you receive credit for promoting the organization.

Please consider purchasing a NJAIHA polo shirt to support the student scholarships. These are great gifts, they help support a great cause, and you can get a tax deduction.

Those of you who are CIHs, don't forget to pick up your verification of attendance forms. These are located the entrance to the dinner meeting room, professional development courses, and conference.

Job Postings

There are many job postings on our web site. If you are looking or just curious check them out.

<http://www.njaiha.org/resources/job-postings/>

There are several job postings on these other organization web sites as well:

<http://njasse.org/jobs/>

<http://www.philaaiha.com/Employment.htm>

2017 Industrial Hygiene and Safety Review Course

Are you looking for an inexpensive way to study for the CIH and CSP exams? Do you need certification maintenance points to meet your re-certification requirements? The New Jersey Section of the American Industrial Hygiene Association (NJ-AIHA) is offering a comprehensive Industrial Hygiene Course. The course is designed to provide basic training in some critical areas of industrial hygiene and safety and will likely be beneficial for those entering the field as well as those who are just looking to sharpen their skills in certain technical areas.

In addition, many of the people who have attended the program have found it to be very helpful in preparing for the CIH and CSP examinations. Certified Industrial Hygienists have the opportunity to obtain CM points per lecture (0.167 points per contact hour). Participants are welcome to attend any or all of the lecture sessions, depending on their individual training needs. People who need certification maintenance points must sign an attendance sheet for each session.

Industrial Hygiene & Safety Lecture Topics

History of Industrial Hygiene, OSH Act Review and IH Management, Epidemiology, Fire Protection, Emergency Response, Ergonomics, Risk Management – Record Keeping, Indoor Air Quality, Bio-Safety, Equipment and Facility Safety, Ionizing Radiation, Non-Ionizing Radiation, Math, Statistics & Calculator Review, Air Pollution, Toxicology, Regulatory & Legal Affairs, Physics and Basic Engineering, Air Sampling – IH Chemistry, Direct Reading Instrumentation, Industrial Noise, Mechanical Exhaust Ventilation, Ethics and Professional Conduct, Respiratory Protection and other Personal Protective Equipment (PPE)

The IH classes will be held Tuesday nights* (6:00-9:00) beginning in June 2017 at the Rutgers Environmental Health & Safety Dept., 27 Road 1, Livingston Campus, Piscataway, New Jersey 08854. Tel. (732) 445-2550 (See the following link to Google Maps Directions)

*Note: First IH Class will run from 6:00 PM to 9:30 PM. Please try and arrive promptly at 6:00 PM. The first half hour will cover registration activities, course orientation information, and other miscellaneous administrative activities. The two courses scheduled on the first night will begin at 6:30 PM and run to 9:30 PM.

<https://www.google.com/maps/place/Rutgers+Environmental+Health+and+Safety/@40.516915,-74.430336,17z/data=!3m1!4b1!4m2!3m1!1s0x89c3c7bf656fffff:0x2b79eadac518c3c8>

Cost: \$150.00 (includes registration, admission to all IH and Safety classes and on-line access to all course materials) **Safety Classes are sponsored by: ASSE**

*The NJ Chapter of the American Society of
Safety Engineers*



Safety Topics have been added to our schedule (included in the price). We will have guest speakers on certain safety topics to help prepare people for the CSP exam. **Safety classes will be held on Thursday nights (6:00 PM).** The website will be updated when the specific dates and topics for the Safety classes have been established. Enrollment forms, directions, and schedule are posted on the NJAIHA web page <http://www.njaiha.org/events/njaiha-summer-review-course/>.

The **NJAIHA Executive Committee** is selling white pique polo shirts with the NJAIHA logo. Point of sale proceeds will serve as a revenue source for our **student scholarship program**. Pricing is based on size and the applicable cost of shipping and handling if the shirts are not picked up at a dinner meeting or other NJAIHA sponsored event.

Please contact Ronnie Tutty at (973) 300-0144 or visit the NJAIHA web page at:
<http://www.njaiha.org/students/polo-shirt-fundraiser/>



Volunteers Needed to Support NJAIHA

NJAIHA is looking for volunteers to help with Outreach Coordination to raise awareness about the profession as career choice, NJ Youth@Work Talking Safety, Program to teach students about health and safety at work, Professional Development Courses (PDCs), 2016 Northeast Industrial Hygiene Conference and Exhibition (NEIHce), student and professional mentoring, collaborate with other interested nonprofits, and many other initiatives. The volunteer experience is rewarding and reaps many benefits, both personally and professionally.

If you a current member of NJAIHA, please consider becoming a volunteer to pursue a designated path and think about your personality, interests, and time commitment and align those values with the opportunities available.

NJAIHA is looking for members to serve as either macro-volunteers (e.g., involving a long-term commitment by a single volunteer, or team of volunteers, to work on a task that cannot be completed within a short period of time) and micro-volunteers (e.g., involving a short-term commitment by a single volunteer, or team of volunteers, to work as needed on a task that can be completed within a short period of time). Make a choice to help support NJAIHA in its mission to protect worker health and spread the word about what we do and what we do it.

What's in It for You?

- (1) Sense of pride, satisfaction, and accomplishment
- (2) Greater self-esteem and self-confidence
- (3) Feeling valued and having made a difference
- (4) Creating connections and building relationships
- (5) Making an impact that can change or shape someone's life for the better
- (6) Being a part of a community that works for the greater good
- (7) Develop, strengthen, or expand leadership skills
- (8) Acquire job-related skills and improve job opportunities
- (9) Gain a better understanding of the profession, volunteering, and NJAIHA

Get involved! To learn more about the volunteering experience with NJAIHA, please contact Candice Kowalewski at: info@njaiha.org.

Member Get-a-Member

You know firsthand the value of being a sustaining member of NJAIHA. By sharing your personal and professional experiences with a colleague and recruiting others, you will:

- (1) Expand your network of industry professionals and support the professional community
- (2) Help your colleagues succeed in their careers
- (3) Strengthen NJAIHA to ensure the voices of industrial hygienists are heard
- (4) Receive recognition and win valuable loyalty rewards points for your recruitment efforts

How It Works!

Reach Out. Tell a friend, colleague or associate about the benefits of NJAIHA membership.

Pull Them In. Have your referral join NJAIHA and list your name in the "referred by" line on their application.

Get Rewarded. For every five new or former member of NJAIHA that you recruit, you will receive a free dinner at one of the NJAIHA monthly dinner meetings. The more people that you sign-up the more opportunity to help NJAIHA grow and prosper.

If you are interested in finding new members or register previous members to join NAIHA, contact Candice Kowalewski

AIHA Mentoring Program: Mentors Needed

The mission of the **AIHA Mentoring and Professional Development Committee** is to engage, motivate, and empower IH professionals through mentorship opportunities, and to encourage the members of the industrial hygiene community to nurture the growth and development of industrial hygiene professionals.

Mentor matching is primarily based upon geographic location, professional interests, and personal interests and/or hobbies. We recommend that participants meet for at least one hour per month and maintain the relationship for at least one year. In order to obtain CM points, ABIH requires six hours per a 12-month period.

If you would like to volunteer and mentor an undergraduate/graduate student or mentor someone within NJAIHA looking for more technical information to enhance their professional career, please contact Candice Kowalewski.

"Preparing for the Future of Our Profession"

Recent NJAIHA Activities in Pictures
Tim Rice, NJAIHA Historian



NJAIHA Fall Professional Development Courses - December 1, 2016
PSEG Hadley Road Facility, South Plainfield, NJ



Barbara Woodhull, NJAIHA Treasurer, and Jack Zybrua, NJAIHA Director of Administration and Web Master, once again donated their services for the day to work the registration table. Thanks again Barb and Jack!



(right) Bernie Fontaine, NJAIHA President, was on hand for the 2016 PDCs and takes a moment here to address the attendees at one of the sessions.



Nancy Orr, CIH, CSP, FAIHA, Senior Director, Global Environment, Health & Safety, BD, Franklin Lakes, NJ, once again served as the instructor for morning Course #1, "Ethical Fitness". Thanks again, Nancy, for helping us out with our annual December PDCs!

"Preparing for the Future of Our Profession"



(left, top to bottom) Instructors **Brent Altemose, Ph.D., CIH**, CSP, Principal Industrial Hygienist, SafeBridge Consultants, Inc., **Charlyn Reihman, MPH, CIH**, Principal Occupational Health Consultant, SafeBridge Consultants, Inc., and **Vincent Daliessio, Jr., CIH**, Industrial Hygiene Project Manager, EMSL Analytical, Inc., lead the discussions during morning Course #2, "Navigating OSHA's Respirable Crystalline Silica Rule".

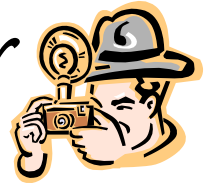


Attendees get a chance to inspect and familiarize themselves with respirable silica air sampling equipment reviewed during the course.



Vince, Brent, Charlyn, and Mark Ostapczuk, 2016 PDC Course Coordinator and NJAIHA Past-President, gather for a photo after being thanked by Mark on behalf of the entire NJAIHA organization for providing their time to conduct this educational and timely PDC.

"Preparing for the Future of Our Profession"



Instructor Craig Tomsky, MS, CIH, Manager, Safety, Health & Environment, L'Oreal USA Research & Innovation, makes a point with the class during afternoon Course #3, "Elements of a Proactive Ergonomics Program and Ideas for Effective Implementation".



Instructor Neil Feldscher, CIH, CSP, Esq., FAIHA, New York City Department of Environmental Protection, is shown here reviewing pre-trial civil procedure with attendees during afternoon Course #4, "Depositions".



(left to right) Craig Tomsky and Neil Feldscher are also thanked by Mark Ostapczuk on behalf of the entire NJAIHA organization for helping to make our annual Fall PDCs once again a successful event.

“Preparing for the Future of Our Profession”



2016 Northeast Industrial Hygiene Conference and Exposition (NEIHce)

Westin Princeton at Forrestal Village, Princeton, NJ - 12/2/16

This year's 70th annual Northeast Industrial Hygiene Conference and Exposition was coordinated and presented by the New Jersey AIHA Local Section, with co-sponsorship from the Philadelphia and Metropolitan New York AIHA Local Sections. Here is a gallery of selected photos from the day's activities. A complete gallery of photos from the event will be posted on the [NJAIHA website](http://www.njaiha.org).



NJAIHA members check in and register attendees and distribute 2016 Conference information packets.



Bernard Fontaine, Jr., NJAIHA President, welcomes attendees to the 2016 Conference and reviews the day's activities during his opening remarks and acknowledgements.



Attendees gather in the Westin Princeton Ballroom during one of the technical presentations at this year's well-attended Conference.

"Preparing for the Future of Our Profession"



Conference Speakers



Speaker: Frank Hearl, PE, Chief of Staff, NIOSH.
Presentation: *"The Value of Health and Safety: Reaping Rewards, Reducing Burdens."*



Speaker: Edwin G. Foulke Jr., Esq.,
Partner, Fisher & Phillips, LLC;
Former Assistant Secretary of Labor
for OSHA. Presentation: *"OSHA's
Recent Changes and Their Impact on
Workplace Inspections."*



Speaker: Catherine Hovde, CIH, CSP, Corporate Health and
Safety Manager, Caterpillar, Inc.; AIHA Board of Directors.
Presentation: *"AIHA + NIOSH - an opportunity for member
engagement."*



Speakers: Robert Sussman, Ph.D., DABT, Managing Director, SafeBridge Consultants, Inc., and Charlyn Reihman, MPH, CIH, Principal Occupational Health Consultant, SafeBridge Consultants, Inc.
Presentation: *"Risk Assessment and Control of Antibody-Drug Conjugates."*



Speaker: Michele Shepard, Ph.D., CIH, Vice President, EHS Management and
Auditing, Colden Corporation. Presentation: *"What's New with Nano? Health
and Safety Management for Engineered Nanomaterials in the Workplace."*

"Preparing for the Future of Our Profession"



Conference Speakers (continued)



Speaker: Brian Harms, PE, CIH, Senior Project Manager, TRC Environmental Consultants, Inc. Presentation: *"Silica Sand, Understanding the New OSHA Requirements with Root Cause Case Studies."*



Speaker: Neil Feldscher, CIH, CSP, Esq., FAIHA, Chief of EHS, New York City Department of Environmental Protection. Presentation: *"Updates to the Toxic Substance Control Act."*

Exposition and Networking



Thanks once again to all our 2016 conference vendors! Vendor participation at each year's conference helps to defray operating and presentation costs.



Attendees get a chance to network during breaks in the technical presentations.



The Presidents of the three sponsoring local sections for the 2016 NEIHce were able to gather during networking time for a group photo. (left to right): John Svagr, President, Metro New York AIHA Local Section, Bernie Fontaine, President, New Jersey AIHA Local Section, and Steve Siegel, President, Philadelphia AIHA Local Section.

"Preparing for the Future of Our Profession"



Exposition and Networking (continued) Corporate Sponsors with Booths



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**\$1000 Gold Level -
Bureau Veritas North America, Inc.**



**\$500 Silver Level - Insurance
Restoration Specialist, Inc. (IRS)**



**\$250 Bronze Level -
SafeBridge Consultants, Inc.**



\$250 Bronze Level - SKC, Inc.

"Preparing for the Future of Our Profession"



Door Prize Winners



The drawing of door prizes at the close of each year's Conference is an established tradition. These prizes are donated by the local sections and selected vendors/corporate sponsors. Here, Peter Harnett, 2016 Conference Planning Committee member, gets ready to present the initial prize to a lucky winner as Barb Woodhull, 2016 NEIHC Planning Committee Chairperson and NJAIHA Treasurer, and Bernie Fontaine, NJAIHA President, look on.



And here's the happy, lucky winner of the initial prize drawing, Mike Lorenz!
Prize: Two growlers of IPA and Express Stout from Lone Eagle Brewing
Donor: NJAIHA



Winner: Courtney Drayer (with Bernie Fontaine)
Prize: \$120 Mayo Performing Arts Center Gift Certificate
Donor: NJAIHA



Winner: Hans Derr
Prize: \$450 Borgata Gift Certificate
Donor: NJAIHA



Winner: Joe Miller
Prize: Hot Air Balloon Ride for Two
Donor: NJAIHA



Winner: Mike Glowatz
Prize: Google Pixel C Tablet
Donor: NJAIHA



Winner: Tanushree Chakravarty (from Mike Glowatz-Colden)
Prize: \$100 Gift Card
Donor: Colden Corporation



Winner: Maura Sheehan
Prize: Grey Apple iPod Nano 16GB
Donor: EMSL Analytical, Inc.



Winner: Matt Meiners
Prize: Mophie Juice Pack Powerstation
Donor: EMSL Analytical, Inc.

COMMENTARY

Open Access

The occupational health of Santa Claus



Sebastian Straube*  and Xiangning Fan

Abstract

Previous publications in the field of Santa studies have not focused on health and safety issues arising from Santa's workplace activities. However, it should be acknowledged that unique occupational hazards exist for Santa Claus. Major occupational health issues affecting Santa are discussed, along with suggestions for future research directions.

Keywords: Santa Claus, Christmas, Occupational health

Background

The health of Santa Claus has been discussed in the medical literature before [1] and it was concluded that "Santa studies is a developing field in public health, and currently there is a disappointing lack of rigorous research..." In particular, there is a lack of research on the occupational health of Santa Claus. Close examination of the working conditions of Santa Claus highlights a number of pertinent occupational health issues; we have attempted to outline the major points below.

Main text

Equipment operation

Sleigh safety is a point of concern, as, in the course of work, Santa encounters a number of transportation-related hazards that are not present for other workers in regulated transportation industries. Firstly, the analysis by Grills and Halyday [1] touches on safe (sleigh) driving, and in this context questions the tradition of leaving Santa a cup of brandy. Though there is uncertainty about whether Santa or the reindeer ought to be considered as the operator(s) proper of the sleigh, the consumption of alcohol during work would typically be discouraged, even if Santa were a sleigh passenger only. Additionally, as far as we are aware, there is a general lack of seatbelts and airbags on sleighs available to Santa, which are not manufactured to the engineering standards of the twenty-first century. Finally, Santa's sleigh holds dual classification as a ground- and air-based transport vehicle, and, in the course of flight,

Santa and the reindeer would be expected to contend with increasingly congested airspace above major cities and airports. Of note, Santa does not routinely travel with a copilot or radio operator, and it is unclear whether radio capability for monitoring standard aeronautical communication frequencies is standard-issue equipment on Santa's sleigh, whether sleigh-mounted radar-based collision systems are available for Santa's use, nor whether Rudolph the Red-Nosed Reindeer's highly vascularized olfactory organ [2] functions adequately as a beacon light for other aircraft.

A recent study confirms that sleigh driving carries a high risk of injury [3]. We recall one disturbing report of Santa's sleigh crashing on a remote tropical island, albeit during wartime (documented in the "I Saw Grampa Cussing Santa Claus" portion of the "Simpsons Christmas Stories" episode of "The Simpsons" [4]). In addition to the possibility of traumatic injuries to Santa or his reindeer which may be sustained during a sleigh crash, there are additional considerations of access to medical care and supplies in resource-poor settings like the one described, which the astute occupational health practitioner must be aware of and plan for in advance. In such an instance as an emergency crash-landing on a remote tropical island, it may be necessary to make use of locally available resources for medical care, for example coconut water for rehydration, which has even been used intravenously to good effect [5]. Of note, any physicians available to provide emergency medical care to Santa would likely need to be prepared to render aid without access to his entire medical record, which resides in paper form at the North Pole and has not been entered into any electronic health records as far as we are aware.

* Correspondence: straube@ualberta.ca

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Work scheduling, cardiovascular health and travel related issues

A further occupational health concern is that Santa's work is rather unevenly distributed throughout the year. Little is known about what Santa does for most of the year, but he likely has to be considered "unemployed" for the largest portion. For the Christmas period, where his workload would demand that he exceed a typical eight-hour work day, Santa ought to be considered a shift worker who works a significant amount of seasonal overtime.

Santa, at least in popular depiction, displays two key cardiovascular risk factors: increased body-mass index (likely obesity), and a smoking habit at times. As these risk factors have been linked with unemployment and shift work [6–8], this is an example of adverse work conditions contributing to increased cardiovascular risk. Dietary patterns and metabolic responses to food have previously been established to be disrupted by shift work, and increased snacking has been seen in night shift workers, who are furthermore hampered in their efforts to maintain a healthy exercise balance [9]. It should be noted that Santa's working hours during wintertime would be expected to fall within the hours of darkness at the North Pole. We note that Santa's consumption of milk and cookies may exceed recommendations in most national nutritional guidelines (e.g., the Canada Food Guide [10]), and that it is unclear what he does for physical activity. Additionally, the nature of Santa's work demands that a large volume of tasks be done in a limited period of time, likely leading to work stress, which has in itself been linked to increased cardiovascular risk [11].

It should be noted that, in addition to working long hours, Santa Claus traverses multiple time zones in the course of delivering presents to children in all parts of the world. We would expect Santa to suffer from significant jet lag due to the amount of travel required to meet his December 25th deadline each year. Indeed, taking into account the transition between time zones, Santa is estimated to work some 36 h at a time consecutively, and cross the 24 time zones of the earth annually on the night of December 24th [12]. It is unclear whether he relies on over the counter supplements (e.g., melatonin, which has recently been shown to be effective in shift workers [13]) or prescription pharmaceutical agents to manage the temporal transitions, nor whether he must resort to the use of stimulants (e.g., caffeine [14]) to manage such long working hours.

Heat stress

Santa Claus, being acclimatized to the colder climate of extreme Northern latitudes, could also be expected to

suffer from heat stress when delivering presents in warmer climates (e.g., Honolulu). Little is known about the efficacy of his fur-lined red suit in thermal regulation, and carrying his sack of presents would reasonably increase his physical workload, exacerbating heat stress further. As his preferred route of entry into the homes of his clients is via the chimney, there is the additional consideration of work in hot and confined spaces, which we believe has not been well-characterized in terms of risk. Indeed, no less esteemed an agency than the United States National Institute of Occupational Safety and Health has previously called attention to the issues Santa may encounter in this and other domains [15]. As it has been previously established that Santa performs the majority of his job duties in a once-annual, approximately 36-h stretch [12], it is extremely unlikely that an opportunity exists for heat acclimatization training beforehand.

The older worker and succession planning

In addition to the adverse cardiovascular effects of shift-work on Santa's health, one important and sadly unmodifiable cardiovascular risk factor is relevant—namely age. Santa's exact age is uncertain (possibly due to lack of proper documentation, bringing up the uncomfortable spectre of whether Santa, indeed, has the proper work permits...but we shall concern ourselves with medical and not administrative matters). As depicted in the advertisements of a certain soft drink manufacturer [16], he appears to have been an older man since at least the 1930s. It is unclear whether Santa has ever been offered a workplace health promotion program geared towards helping older workers remain productive and contributing members of the workforce, nor whether succession planning has ever been discussed with Santa.

Mental health

Santa's decision making capability is typically accepted as adequate by his clients and his mental health is not usually called into question. According to popular legend and song he is, at least when performing his duties in the urban environment ("Santa Claus is coming to town" [17]) gifted with near-omniscience ("He sees you when you're sleeping / He knows when you're awake / He knows if you've been bad or good..."). However, he still apparently keeps written records and checks them repeatedly ("He's making a list, Checking it twice"). While double checking is to be encouraged for certain safety-sensitive work tasks, the practice does beg the question of whether Santa is acting according to standard operating procedures, or whether he may instead display a tendency towards compulsive checking. Recent evidence does link work stress with many common mental disorders, including obsessive compulsive disorder [18].

Additionally, Santa's overall mental health may be adversely impacted by years of having to operate under government scrutiny. The North American Aerospace Defense Command has openly admitted that Santa's December travels are tracked, in an annual tradition of government surveillance a-la "Big Brother" dating back to 1955 [19].

Workshop ergonomics

Santa would be considered a giant among elves. While the average height of the latter has not been well established in the published literature, it is commonly accepted that they are diminutive in stature. Therefore, in a workplace where workstations and equipment are sized to comfortable dimensions for elvenkind, it is highly probable that Santa would find himself outside the 95th percentile of elven height. As a consequence, he would likely require a dedicated ergonomic assessment and adjustment of the shared work environment in order to prevent progressive-onset musculoskeletal disorders.

Conclusions

It has previously been reported that there is no standardized requirement for Santa to have a medical check-up, other than pre-employment drug screening [1]. Given the above-mentioned concerns from an occupational health perspective, we feel that it is time to adopt an evidence-based approach to develop, firstly, a comprehensive workplace occupational health program for Santa, and, secondly, a standardized and reproducible protocol for assessment of Santa's fitness for work. However, we are sensitive to recent trends emphasizing workplace inclusiveness, and would not want to single out Santa for special treatment, thereby possibly contributing to workplace stigma. We therefore additionally suggest that future research directions include efforts to similarly explore and develop recommendations concerning the occupational health of reindeer and elves.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

SS and XF jointly conceived of the idea and wrote this paper. Both authors read and approved the final manuscript.

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