

Annex I

Public

Claude Ferguson FSA, FCIA

Independent Consulting Actuary, Montreal

Career Profile

Fellow of the Canadian Institute of Actuaries (CIA) and the Society of Actuaries (SOA), cumulating more than 30 years of experience with responsibilities spanning corporate, product development, and strategic marketing functions, I am now providing consulting services to a wide array of benefit and service providers and sponsors. He also recently stepped up to the task of providing actuarial expert testimonies into judicial processes.

I am known to have an excellent reading and understanding of the Canadian benefit insurance environment and a strategic vision for business development and public policy setting, particularly with health programs. The various roles I have taken over the last 20 years, lead me to develop a strong vision for **private and public programs** in **Canada and many countries (US & Europe)** to develop comparative advantages from their cost, fiscal and performance standpoints. I maintain expertise to identify **key emerging trends** as well as **risk identification** for the various health components for public and private benefit programs, as well as the critical coordination of benefits needed to manage them.

Professional Experiences

ACTEGIS Consultants Inc.

July 2015-present

Owner and Consultant

I founded an actuarial & benefit management consulting firm in 2015. Over the years, my spouse-partner and I have successfully managed many types of mandates focussing on strategic and analytical needs, including product development and claim management for insurance companies, reinsurance, third-party service (TPAs) or health providers, employers, unions, legal firms, professional associations, and IT organizations.

Canassurance Blue Cross

2014-2015

Vice-President Actuarial Services

In this senior management role, I am responsible for strategic planning and development to meet financial performance, establish actuarial reserves and pricing, and support health and life product development. Above all, I am a member of the executive team for an insurance company undergoing significant transformation, while maintaining insurance operations on multiple product platforms: life & health insurance, P&C, travel assistance, and other financial products.

Medavie Blue Cross

2002-2014

Director, Actuarial Services

As Director of Actuarial Services, I am responsible for monitoring the financial performance and reporting, help set our risk management and capital strategies, monitor the assessment of financial liabilities and pricing, and product development for group and individual health and life products. With the company CFO, we coordinate pricing policies and corporate financial objectives, set strategies and plans to maintain adequate capitalization levels, as well as set suitable investment strategies needed for the insurance fund (SIPP). I also provide leadership for key product development or for major corporate customers.

Maritime Life

2001

Quebec Region, Group Insurance Sales & Service, Director,

Responsible for business development and services for plan managers in Quebec & Ottawa regions, on a portfolio totalling more than \$180M of annual

income. Manage a team of 16 persons in sales, service, contract writing, and billing.

Professional Experiences

Standard Life **1997 - 2000**
Business Strategy Manager 1999 - 2000
Group Insurance Product Manager 1997 - 1999

I develop, promote and implement the Canadian business plan for the group insurance line of business. I also manage 3 regional teams totalling 16 persons who are responsible for marketing and underwriting group insurance plans to Small & Medium Enterprises located across Canada. I provide national leadership in a cross functional team.

St-Lawrence Reassurance **1989 - 1997**
(now Optimum Re)
Vice-President, Group Underwriting & Actuarial 1994–1997
Actuarial Assistant 1989–1994

Initially, supervises a small team responsible to assist the Designated (Valuation) Actuary responsible for both Canadian & US Operations, establishing actuarial liabilities and overtaking numerous mandates related to business acquisitions and IPOs. Later, I took over more responsibilities to include underwriting and product development on a group reinsurance portfolio of more than \$15M of net annual income.

Blondeau Consulting (now Optimum Consulting) **1986–1989**
Perform various actuarial works related to individual and group insurance and pension benefits consulting mandates, as well as corporate actuarial functions (assist Appointed Actuaries for 3 life insurance companies).

La Survivance Mutual Life **1982–1986**

Other Professional Activities

Member of the Canadian Institute of Actuaries' (CIA) Practice Development Committee as well as on its **Banking sub-committee** - since September 2018.

Director of the Canadian Institute of Actuaries' (CIA) Board - from 2011 to 2014, 2015-2018, and 2019-2022. Chair of the CIA Emerging Practice Committee. Previously member of the Governance Committee. Also, chaired the CIA Risk Management Committee and member of the Education & Eligibility Committee from 2011 to 2014. Member of the CIA Healthcare committee for many years, currently sitting on the Practice development council and the Banking committee. Member of various CIA and joint SOA-CIA research steering committees (POG).

Member on the Technical Workgroup, and then Director on the Canadian Drug Insurance Pooling Corporation (CDIPC) Board - from inception until November 2014.

Chair of CIA's Healthcare Practice Committee since 2000. As such, not only did I lead this group to develop and release key CIA public policy statements (including submissions to Kirby and Romanow commissions), but I also acted as CIA spokespersons with the media for healthcare related events (health ministers' conferences, premiers' conferences, Council of Federation meetings, Menard report release, Chaoulli judgement, etc.), establishing and maintaining contacts

with either private (Conference Board of Canada, C.D. Howe Institute, etc.) and public organizations (provincial and Federal Health & Finance).

Executive Team Member and Canadian representative for the International Actuarial Association (IAA) Health Section since 2002. I also acted as liaison between our Section and the Organization Committee's Scientific Program Management at the IAA congress held in Paris, June 2006.

Leadership on various Quebec's Health Insurance Groups since 1998 and in particular during the period leading to the creation of the Canadian Drug Insurance Pooling Corp. (2013) and current reviews leading to developing a National Pharmacare policy for Canada (2019).

Publications & Conferences on Health

Publication of numerous articles in business magazines and public press, dealing with social and economic issues related to policy setting, insurance products, and recent development in public and private healthcare, including the development of a potential reform of the public-private pharmacare framework in Canada. More recently, I published 2 papers in 2019 on the 'Policy Options' forum of the 'Institute for Research On Public Policy', one that summarizes a the research I have done on the performance Quebec hybrid (private-public) drug insurance system, and another one on a research on inter-generational perspectives on governance of our public healthcare programs performed for Force Jeunesse – a gen Y think-tank group:

<https://tinyurl.com/y5yxx5pt>

<https://tinyurl.com/y2x87r5k>

Among others:

"Why We Need a Medicare Actuary in Canada", CIA, 2002

"Does Medicare Really Need More Funds?", CIA, 2002

"A Bitter Pill", Beyond Risk, Spring 2011

"D'abord la stabilité", La Presse, June 2005

Conferences : Canadian Pension & Benefit Institute, September 2001; Quebec Actuarial Club, November 2004; Society of Actuaries & Canadian Institute of Actuaries, June 2003; Perform, March 2006; .

Education

Laval University, 1979 – 1982, B. Sciences, Actuarial Science.

Written & Spoken Languages

French and English.

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ACTEGIS

November 9, 2022

CONFIDENTIAL

Sent by electronic means

Me. Stéphane Bourgon, ADE
Counsel for Mr. Bosco Ntaganda
International Criminal Court
The Hague
The Netherlands

Object : Brief Analytical Report on Statistical Considerations Related to Sampling to Support the Valuation Process Initiated Under The “Order for the implementation of the Judgement on the appeals against the decision of Trial Chamber VI of 8 March 2021 entitled “Reparations Order” (“Implementation Order” in the case of The Prosecutor v. Bosco Ntaganda).

Dear Me Bourgon,

Further to your request, I am pleased to submit my report on Statistical Considerations Related to Sampling to Support the Valuation Process Initiated Under “Order for the implementation of the Judgement on the appeals against the decision of Trial Chamber VI of 8 March 2021 entitled “Reparations Order” (“Implementation Order” in the case of The Prosecutor v. Bosco Ntaganda)..

Please do not hesitate to contact me if you need any further assistance.



Claude Ferguson, FCIA
Consulting Actuary

Report enclosed

Brief Analytical Report on Statistical Considerations Related to Sampling to Support the Valuation Process Initiated Under “Order for the implementation of the Judgement on the appeals against the decision of Trial Chamber VI of 8 March 2021 entitled “Reparations Order”” (“Implementation Order” in the case of The Prosecutor v. Bosco Ntaganda).

MANDATE

I was approached by Me Stéphane Bourgon *Ad.E.* to provide expert advice on statistical issues raised under the *“Order for the implementation of the Judgement on the appeals against the decision of Trial Chamber VI of 8 March 2021 entitled “Reparations Order””* (“Implementation Order” in the case of *The Prosecutor v. Bosco Ntaganda*).

Statistical and sampling issues are raised around the methodology proposed, namely the sample size needed to achieve satisfactory representativity of results with regard to the target population.

This a first step leading toward a subsequent evaluation for the claims resulting from the crimes committed during the period and in the regions covered by the Trial Judgement for which Mr Ntaganda was found guilty, in order to be eligible for reparation.

Unless each case is individual evaluated, sampling techniques may be used to estimate eligibility rates for reparation and eventually reparation costs that result from the Trial Judgement.

Also, preliminary work has been made to assess the eligibility and characteristics of certain claims within each group.

At this point, no data or data structure is provided other than generic information provided in the Implementation Order.

BACKGROUND (information drawn from the Implementation Order)

1. The Trial Chamber in this case has decided to assemble a sample of victims based on available victims’ applications;
2. The Trial Chamber insists on the requirement for the sample to be representative and has accordingly adopted a methodology to assemble a representative sample.
3. Pursuant to the Trial Chamber’s methodology, the sample is proposed to be assembled as follows:

Step 1 – Creation of a “universe” of potential victims’ applications, comprising:

- The 1837 victims of the attacks that participated in the trial proceedings (PVATT) – **without excluding the 661 victims considered by VPRS as not meeting the objective requirements to be eligible for reparations;**
- Less the 45 PVATT found to be eligible for reparations by the TFV;
- Plus the 284 Participating child soldier victims that participated in the trial proceedings (PCSV);
- Less the **unknown** number of PCSV who meet the requirements to be victims in both the Ntaganda case and the Lubanga case (BNTL PCSV);
- Less the 24 PCSV found to be eligible for reparations by the TFV;
- Plus the 91 applications submitted by new potential victims (NPV)

Step 2 – Assembly of the ‘Sample’ as follows:

- Separation of the ‘universe of potential victims’ in two groups, namely potential victims of the attacks (Pot VATT) and potential child soldier victims (Pot CSV)
- Creation of a first ‘sample’ of Pot VATT by:
 - i. Randomly selecting 5% of the Pot VATT from the universe; and
 - ii. Adding the 45 participating victims of the attacks (PVATT) found to be eligible for reparations by the TFV
- Creation of a second ‘sample’ of Pot CSV by:
 - i. Randomly selecting 5% of the Pot CSV from the universe; and
 - ii. Adding the 24 participating child soldier victims (PSCV) found to be eligible for reparations by the TFV;

QUESTIONS ON THE SAMPLING METHODOLOGY PROPOSED

The question are:

1. how to structure the data available in a way to create a statistically valid random process that can be used to draw scientifically valid conclusions applicable to the whole “universe of potential victims”? and
2. what should the proposed sample size be for the expected survey results to be representative of the “universe of potential victims”?

There are three categories of victims, namely :

- Category 1 - Participating Victims in the Ntaganda Case (PVATT and PCSV)
- Category 2 – Potential victims in the Ntaganda Case who also qualify as potential victims in the Thomas Lubanga Case (BNTL CSV)
- Category 3 – New potential victims who did not participate in the Ntaganda case (NPV)

Regarding Category 1 Victims:

There are 2121 participating victims, who can be divided in two groups:

- Group 1 – Participating victims of the Attacks – 1837 (PVATT)
- Group 2 – Participating child soldier victims – 284 (PCSV)

Survey of the Pot VATT

We are informed that previous work has been done to assess the eligibility and characteristics of the claims within each group.

All 1837 PVATT dossiers were referred to an agency called VPRS for a preliminary review. The VPRS concluded that 671 VATT did not meet the objective requirements to qualify as potential victims;

45 VATT dossiers were referred to an agency called TFV for a determination of their eligibility. The TFV concluded that the 45 VATT met all requirements to be eligible as potential victims of the attacks (Pot VATT), deserving reparations;

PVATT can be further divided pursuant to numerous characteristics that may impact the reparations they may receive / require and possibly the cost of such reparations, including, *inter alia*:

- i. The nature of the crimes committed against the victim – The Convicted Person was found guilty of 14 different crimes in relation to attacks;
- ii. The locations where the crimes were committed and the harm was suffered by the victims – There are 13 such locations confirmed in the Trial Judgment;
- iii. The type of harm suffered by the victims – There are at least three types of harm suffered by the victims, namely physical, psychological and material.

One issue that arises is whether the previous eligibility information could be used '*a posteriori*', as proposed by the Trial Chamber, to estimate eligibility rate for the population of 1837 PVATTs.

In my opinion, it would be incorrect to use prior knowledge on the 671 PVATT found *not* to be eligible or the 45 PVATT determined to be eligible as an *ex-post* component of a random sample.

If it were the case, a serious bias would result from imposing an arbitrary weight to those 2 categories in the results derived from the sample, thus preventing us from drawing any statistically valid conclusions on the entire population of 1837 PVATT. Therefore, both subsets should be included in the “universe” of potential victims to be sampled, as for any other cases documented.

The next issue is to determine the sample size needed to achieve the expected representativity. The claim valuation process is a multi-stage random process involving 3 stages:

1. Determining whether a PVATT is eligible for reparation under the Ntaganda judgement;
2. Determining the nature of the crime; and
3. Determining the characteristics of the damage and the victim leading to properly assessing the value of appropriate reparation (or the claim distribution for each crime).

In this document, I use the words ‘claim’ and ‘reparation’ interchangeably.

Although the Implementation Order only considers measuring eligibility, each stage of the random process adds to the variability of the final outcome, and thus should be accounted for in setting the sample size that will generate statistically valid estimates needed to assess the total value of the compensation for damages within some level of precision.

If we had information about the proportions for the crimes and characteristics of the population (or distribution of claim amounts for each crime), we could develop the characteristics of the compounded distributions, or model the total claim amount process and accordingly determine the sample size needed to develop a level of precision targeted within a known confidence level.

But we don’t have access to the entire valuation process information and all we can infer from the limited information provided is the maximum variability of the eligibility rate measured from the sample (stage 1 of the valuation process).

Assuming that the eligibility process is a binomial distribution that converges to a normal distribution, the maximum variability resulting from a sample 5% of the 1837 PVATTs would draw a sample of 92, and the maximum range for the 95% confidence intervals for the key proportions derived would span + or – 10.2% from the mean measured, for a total range of potential error of 20.4%.

In other words, where the sampled eligibility proportion is 50%, we could only conclude, in samples of 92 individuals, that the true underlying eligibility rate for the 1837 PVATTs would lie within the interval [39.8%, 60.2%] 19 times out of 20 (in other words, a 95% confidence interval).

It should further be noted that a 10.2% error on a 50% estimate amounts to a relative error rate of 20.4% (10.2/50), both below or above the measured mean estimate.

In comparison, typical surveys run for in usual statistical analysis use samples leading to an error interval that is less than 5% (a 10% relative error both below or above the mean) with a 95% confidence level require a sample size of 384, 1537 for a 2.5% error interval – and that's without considering for increased sample size to account from the added variability associated to the claim distribution for the various claim types.

Survey of the Pot CSV

There are 284 PCSV.

PCSV can be further divided in two sub-groups, namely PCSV exclusively in the Ntaganda case (BN PCSV) case and PCSV who meet the requirements to be victims in both the Ntaganda case and the Lubanga case (BNTL PCSV).

- The respective number of BN PCSV and BNTL PCSV is unknown to the Defence, although this figure is known by other entities;
- 24 PCSV were referred to an agency called TFV for a determination of their status. The TFV concluded that the 24 PCSV met all requirements to be eligible as Potential child soldier victims (Pot CSV), deserving reparations;
- Pot CSV can be further divided pursuant to numerous characteristics that may impact the reparations they may require and the cost of such reparations, including:
 - i. The nature of the crimes committed against the victims – The Convicted Person was found guilty of four (4) different crimes in relation to child soldiers attacks, which can be divided under the following headings, namely (i) enlistment, conscription or use in hostilities; and (ii) rape or sexual slavery
 - ii. The locations where the crimes were committed and the harm was suffered by the victims – There are 10 such locations confirmed in the Trial Judgment;
 - iii. The ethnic group to which the victims belong, namely Hema or other groups such as Alur; and
 - iv. The type of harm suffered by the victims – There are at least three types of harm suffered by the victims, namely physical, psychological and material.

For the same reasons invoked for the estimation and valuation of PVATT, prior knowledge on the individual from the “universe” of potential child soldier victims cannot be used to exclude or pre-select certain individuals in the sample to be used to assess the eligibility and subsequently the claims from the 284 individuals.

In addition, a sample of 5% from the “universe of 284 victims” would involve selecting only 14 cases.

Assuming that the eligibility process is a binomial distribution that converges to a normal distribution (a questionable assumption if the sample size remains as low), the maximum variability resulting from such a small sample imply that the maximum range for the 95% confidence intervals for the key proportions derived would span + or – 26% from the mean measured, for a total range of potential error of 52%.

Further, in order to avoid to correct results for the low degree of liberty (preventing from assuming a normal distribution of results), a sample of at least 28 would be needed.

More information may be needed on the tolerance to error margins in estimating the proportion and the materiality of the value of claims for the eligible PCSVs, but in end there may not be any valid sample size that may provide a high precision estimate at a satisfactory confidence level.

Regarding Category 2:

Thomas Lubanga victims are Child soldier victims (CSV) who have been determined to be eligible for reparations in the Lubanga case;

Thomas Lubanga who qualify as victims in both the Lubanga and the Ntaganda case are not to be included in the universe to be sampled.

However all CSV who *do not* qualify as victims in the Lubanga case should be included.

Regarding Category 3:

These are *new* potential victims (NPV) who did not participate in the Ntaganda case but who meet or claim to meet *prima facie* the requirements to be eligible to obtain reparations in the Ntaganda case;

To this day, 91 forms provided by NPV are known to have been submitted to the Registry / VPRS.

Known NPVs should simply be incorporated in the “universe of victims” with the other potential VATT and CSV.

There will be more NPV in the entire population of the regions where the attacks took place.

The total potentially remaining number of NPV in the Ntaganda case is unknown

Indeed, whereas it was previously stated that the number of victims ranged from at least approximately 1100 to a minimum of 100,000, these figures have since been set aside.

Question: How can the conclusions drawn from the existing datasets, or samples derived thereof, be of any assistance in determining the total number of victims in the Ntaganda case?

Unless we can draw a true random sample from the entire from those regions, one cannot draw any estimate for the prevalence or eligibility proportions for the total population.

The dataset of 2121 cases is not drawn randomly from the total universe of potential victims. Therefore, conclusions derived from true random samples from the 2121 active participants can only serve to derive estimates for that population.

The only way to develop measures on the total number of cases (beyond the 2121 cases known) is to be able to rely on sufficiently large quantitative estimates for the entire population and to have the ability to randomly survey the entire population.

TOTAL MONETARY AWARD VALUATION

Question: How can the conclusions drawn from the sample be of assistance in determining the total monetary award required to repair the harm caused?

As stated above, the total monetary award can be estimated from a sample based on a compounded random process that incorporate claim amount distributions for the various types of claims.

Stratified sampling techniques and statistical analysis should be used to adjust sample size for each *strata* so as to achieve an acceptable balance between sample size, margin of error for the total monetary award, and the number of strata.

CONCLUSION

Give the limited time and data available to analyze the first steps for sampling the data, it was neither possible nor feasible for me to provide an exhaustive report. However, based on the limited information contained in the Implementation Order along with a factual background, it would appear to me that the parameters proposed would hardly support the level of precision level one would expect to support a valuation process. Obviously, I stand ready to supplement my observations and to provide the Chamber with a more detailed report on request.



Claude Ferguson

Actuary

ACTEGIS Consultants inc.

Saint-Lambert, Québec, Canada, November 8, 2022